EVALUATION OF CONNECTICUT'S MOBILE CRISIS INTERVENTION SERVICES

IMPACT ON BEHAVIORAL HEALTH EMERGENCY DEPARTMENT USE AND PROVIDER PERSPECTIVES ON STRENGTHS AND CHALLENGES

PREPARED FOR

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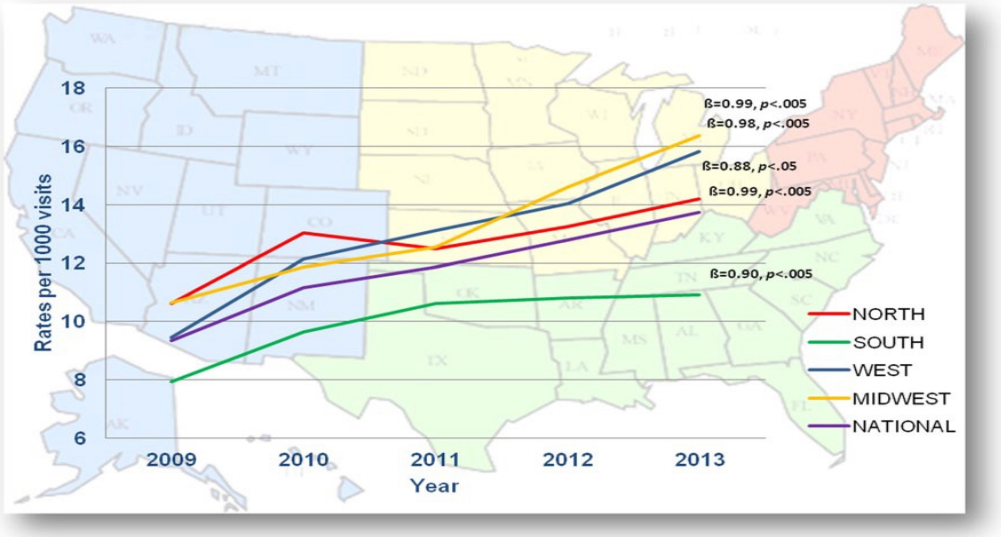
Introduction and Overview

Pediatric behavioral health visits to emergency departments have skyrocketed nationally in recent years. As Figure Intro-1 below suggests, upward trends are visible in all regions of the country and nationally. For many youth, emergency departments (EDs) are less than optimal treatment settings. EDs often lack providers with the specialized training necessary to address child mental health needs and are often not equipped to provide the follow-up care and connections needed to adequately address a child's behavioral health problems. Behavioral health treatment in the ED is also expensive. With this in mind, the State of Connecticut developed a community-based, mobile intervention service for addressing emergency behavioral health needs of youth. The Mobile Crisis Intervention Service (Mobile Crisis) program provides timely, community-based intervention by mental health professionals to address acute behavioral health needs. This report explores research designed to evaluate the impact of the Mobile Crisis, focusing on three main questions: 1) How effective was Mobile Crisis in preventing youth with behavioral health diagnoses from being admitted to EDs compared to a comparison group of non-Mobile Crisis youth with behavioral health ED (BHED) use? 2) Among youth receiving Mobile Crisis services, what were the variables most associated with subsequent ED service use? 3) What are the major barriers and facilitators of Mobile Crisis success? This report is divided into five sections. The first section provides a comprehensive literature review relevant to the evaluation of the Mobile Crisis service. The second section addresses the first research question, employing a quasi-experimental, "propensity score matching" analytic approach. The third section focuses on a cohort of Mobile Crisis users, employing regression procedures designed to identify the optimal predictor variables of ED use within this cohort. The fourth section summarizes our findings from a series of focus groups carried out during 2017-2018 with Mobile Crisis provider sites. The fifth section provides brief conclusions and suggestions for further research in the form of bullet points. During the study timeframe the program was referred to across the state as Emergency Mobile Psychiatric Services, or EMPS. Currently, the program is referred to as Mobile Crisis Intervention Services, or Mobile Crisis. In order to reflect current program terminology, we will refer to the program as Mobile Crisis throughout most of this report.

Figure Intro.1: ***Rates per 100 visits of pediatric behavioral health visits, 2009-2013***



Adapted from Rogers et al., 2017
Betas represent time trends for the range of years from 2009 to 2013 for each region; p values indicate whether trends are significantly different from 0.

Section I: Review of the Relevant Literature & Key Components of the Connecticut Mobile Crisis

Prevalence of Youth Behavioral Health ED Use

Over half a million children in the US present at emergency departments (ED) for psychiatric reasons annually (Pittsenbarger & Mannix, 2014; Sheridan et al., 2015). EDs have seen tremendous growth in pediatric mental health visits in recent years (Grupp-Phelan, Harman, & Kelleher, 2007; Pittsenbarger & Mannix, 2014; Sills & Bland, 2002). From 2009 to 2013, psychiatric ED visits among patients under 18 years of age increased by over 40% in the U.S., with significant increases found in each of the four census regions (see Figure Intro-1) (Rogers, Mulvey, Divietro, & Sturm, 2017). This trend is problematic not only because of the strain it puts on the emergency medical system, but also because EDs are ill-equipped to provide the type of care appropriate for patients who are experiencing psychiatric crises (Dolan & Fein, 2011; Shannahan & Fields, 2016).

Macro Level Causes

High rates of psychiatric ED utilization among youth may be a consequence of a fragmented healthcare system wherein young people have limited access to mental health treatment (Dolan & Mace, 2006; Edelsohn, Braitman, Rabinovich, Sheves, & Melendez, 2003; Geller & Biebel, 2006; Jabbour et al., 2016; Larkin, Claassen, Edmond, Pelletier, & Camargo, 2005; Pittsenbarger & Mannix, 2014; Rogers et al., 2017) and are relying on the ED for mental health primary care (Brown & Schubert, 2010; Lynch, Bautista, Freer, Kalynlych, & Hendry, 2015). The surge in ED use for youth with psychiatric issues also appears to be, in part, driven by inappropriate referrals by community providers—namely schools—who lack the capacity to deal with the psychiatric and behavioral issues exhibited by the young people they serve (Edelsohn et al., 2003; Grudnikoff, Taneli, & Correll, 2015; Soto et al., 2009). Researchers estimate that 33-40% of pediatric ED visits for mental health reasons are not urgent (Edelsohn et al., 2003; Sills & Bland, 2002; Soto et al., 2009) and almost half of school-based psychiatric referrals to the ED are inappropriate (Grudnikoff et al., 2015).

Individual Risk Factors for Youth Behavioral Health ED Use

The literature suggested a variety of factors, including past service use, type of diagnosis, and key sociodemographic characteristics are correlated with greater use of the ED for psychiatric reasons. First, researchers have indicated that a large portion of psychiatric ED visits were by youth who have had prior service use. Specifically, many of these youth had a history of psychiatric hospitalization (Goldstein et al., 2007; Grudnikoff et al., 2015; Santiago, Tunik, Foltin, & Mojica, 2006); prior and/or current outpatient mental health treatment at the time of their ED visit (Goldstein, Frosch, Davarya, & Leaf, 2007; Kalb, Stuart, & Vasa, 2018; Soto et al., 2009); and prior and/or current use of psychiatric medications at the time of their ED visit (Grudnikoff et al., 2015; Santiago et al., 2006; and Soto et al., 2009).

Since researchers used different methods of classification and varied in their reporting of existing diagnoses and diagnoses at disposition, we found it difficult to summarize diagnostic correlates of ED use. Overall, however, mood/affective disorders (including depression) were most prevalent in the literature (Ali, Rosychuk, Dong, McGrath, & Newton, 2012; Carlisle, Madmani, Schachar, & To, 2012; Edelsohn et al., 2003; Gill et al., 2017; Grudnikoff et al., 2015, Hunter, Schaefer, Kurz, Prates, & Sinha, 2015; Kalb et al., 2018; Mahajan et al., 2009; Matsu et al., 2013; Pittsenbarger & Mannix, 2014; Rogers et al., 2017; Santiago et al., 2006; Sills & Bland, 2002; Soto et al., 2009). Next were anxiety-related disorders (Ali et al., 2012; Mahajan et al., 2009; Matsu et al., 2013; Gill et al., 2017; Lynch et al., 2015; Pittsenbarger & Mannix, 2014; Santiago et al., 2006; Sills & Bland, 2002) and disruptive behavior disorders (including conduct and oppositional defiance disorders) (Edelsohn et al., 2003; Grudnikoff et al., 2015; Hunter et al., 2015; Kalb et al., 2018; Mahajan et al., 2009; Rogers et al., 2017; Santiago et al., 2006; Soto et al., 2009). Attention deficit hyperactivity disorder

(ADHD) and hyperkinetic syndrome of childhood (Edelsohn et al., 2003; Grudnikoff et al., 2015; Lynch et al., 2015; Sills & Bland, 2002; Soto et al., 2009) as well as substance abuse disorders (Ali et al., 2012; Gill et al., 2017; Lynch et al., 2015; Matsu et al., 2013; Pittsenbarger & Mannix, 2014) were also highlighted in the literature.

Demographic risk factors for psychiatric ED use were also inconsistently reported; however, some key trends emerged. The most prominent finding was that adolescent patients were at significantly increased risk for psychiatric ED use compared to younger children (Ali et al., 2012; Edelsohn et al., 2003; Grupp-Phelan et al., 2007; Lynch et al., 2015; Matsu et al., 2013; Pittsenbarger & Mannix, 2014; Santiago et al., 2006; Sills & Bland, 2002; Soto et al., 2009). The average age of youth patients presenting to the psychiatric ED reported in seven studies ranged from 11.3 to 14.6 years (Grudnikoff et al., 2015; Mahajan et al., 2009; Hunter et al., 2015; Rogers et al., 2017; Santiago et al., 2006; Sills & Bland, 2002; Soto et al., 2009).

With respect to gender, Ali et al. (2012) and Grudnikoff et al. (2015) both reported that males were at increased risk of psychiatric ED use at younger ages, but that females were at greater risk at older ages. Some research indicated a higher overall prevalence of females (Ali et al., 2012; Edelsohn et al., 2003; Gill et al., 2017; Santiago et al., 2006; Sills & Bland, 2002). While others indicated a higher overall prevalence of males (Goldstein et al., 2007; Grudnikoff et al. 2015; Lynch et al. 2015; Matsu et al. 2013).

The research on race and ethnicity was inconclusive. Some research indicated that Whites were at higher risk than racial minorities (Lynch et al., 2015; Matsu et al., 2013; Pittsenbarger & Mannix, 2014), while others reported Whites were at lower risk than racial minorities (Grudnikoff et al., 2015; Rogers et al., 2017; Sills & Bland; 2002). Similarly, Lynch et al. (2015) and Pitssenbarger and Mannix, (2014) asserted that non-Latino/Hispanic youth were at greater risk of psychiatric ED use compared to Latino/Hispanic youth, but Grudnikoff et al. (2015) reported that non-Latino/Hispanic youth were at decreased risk in their sample of school-referred youth.

Studies have suggested at least three other variables are important correlates of ED use that need to be considered: child welfare involvement, insurance status of parents and region of service. Several studies (e.g., Edelsohn et al., 2003; Grundnikoff et al. 2014; and Soto et al., 2014) suggested that a large portion of youth who visit the ED for behavioral healthcare treatment have had prior child welfare agency involvement. A handful of studies emphasized the potential role of insurance status of patients as a predictor of behavioral health ED involvement. Three studies indicated that the largest portion of ED visits were by patients with public insurance (Matsu et al., 2013; Pittsenbarger & Mannnix, 2014; Rogers et al., 2017). One study suggested that public insurance patients were a major driver of the increase in national psychiatric ED visit increases (Shannahan & Fields, 2016). Nevertheless, we note that in contrast, Soto et al. (2009) found that the majority of ED visits in their sample came from patients with private health insurance. Regarding region, we note that three national studies found higher rates of psychiatric ED use in the northeast region of the country compared to other regions (Grupp-Phelan et al., 2007; Pittsenbarger et al., 2014; Sills & Bland, 2002).

Risk for Behavioral Health ED Recidivism

In evaluating rates of recidivism to the ED, as in all research on health service recidivism, research on ED use recidivism varied with respect to service use definitions and length of follow-up time employed. Overall, however, it seems clear that young people who visit the ED for mental health reasons experience high rates of recidivism. Ali et al. (2012) reported that 24.8% of their sample had more than one mental health ED visit during the course of their 6-year study. Similarly, Mahajan et al. (2009) indicated a 24.4% rate of repeat visits over a 2-year study period. Soto et al. (2009) found that 9.0% of visits that occurred in one year were repeat visits and that 19.1% of patients in their sample had previous psychiatric ED visits. Goldstein et al. (2007)

observed that 19% of patients in their sample returned to the ED within 6 months of their initial study visit. Grudnikoff et al. (2015) reported that 10.3% of psychiatric ED visits referred by schools were visits by patients who had a prior psychiatric ED visit. Finally, Carlisle et al. (2012) found that 13.2% of patients in their sample recidivated to the ED within 30 days.

With respect to specific risk factors for recidivism, Goldstein et al. (2007) found that Department of Social Services (DSS) involvement, disruptive behavior, history of psychiatric hospitalization, and diagnostic comorbidity were significantly correlated with higher rates of recidivism. Goldstein et al. (2007) also indicated that involvement in mental health treatment at the time of the ED visit was significantly associated with higher rates of return to the ED. Relatedly, Carlisle et al. (2012) found that adolescents who received treatment after their ED visit were 22% more likely to have an ED visit or readmission at one year than adolescents who did not receive treatment. Finally, Kalb et al. (2018) found that adolescents with Autism Spectrum Disorder (ASD) had a higher rate of ED recidivism and psychiatric hospitalization after visiting the ED compared to both control groups (adolescents with ADHD and adolescents with neither diagnosis). Adolescents with ADHD had a higher rate of return and hospitalization than adolescents with neither diagnosis.

Mobile Crisis Services for Youth in Other States – Research on Implementation and Impact

There is an urgent need for states to develop interventions that will improve behavioral health treatment for youth as well as alleviate the burden of this population on the ED system. One innovative option is mobile crisis services. Most states offer mobile crisis services to adults (National Council for Behavioral Health, 2015); however, mobile crisis programs that target children and adolescents appear to be less prevalent. Mobile crisis service programs that target youth have been documented in Rochester, New York; Milwaukee County, Wisconsin; King County, Washington; Ventura County, California; and the states of Massachusetts, New Jersey, Texas and Connecticut (Shulman & Athey, 1993; Shannahan & Fields, 2016).

A limited body of research suggests these programs effectively divert youth s from ED visits and hospitalization. Shulman and Athey (1993) reported that Rochester's Youth Emergency Services' (YES) mobile crisis team prevented an estimated 250 ED visits and out-of-home placements in the first 13 months after it was established. Additionally, the Agency for Healthcare Research and Quality of the US Department of Health and Human Services (HSS) (2008) asserts that, since the 1994 implementation of Milwaukee's Children Mobile Crisis Team (CMC; formerly known as Mobile Urgent Treatment Team—MUTT), the county has seen a reduction of annual costs of hospitalization from $10.5 to $5.0 million. In 2007, for example, 79% of mobile cases were diverted from hospitalization and those that were hospitalized had significantly shorter stays than those who were not seen by the crisis team (HHS, 2008).

Furthermore, King County's Mental Illness and Drug Dependency (MIDD) Oversight Committee (2014) reported that the Children's Crisis Outreach Response System (CCORS) saved the county $1 million through its diversion of 81% child hospitalizations at local EDs in 2012. The mobile team also connected 62% of previously unengaged families it served with community providers (MIDD, 2014). Finally, Shannahan and Fields (2016) assert that a Texas initiative, which included (but was not limited to) the Mobile Crisis Outreach Team (MCOT) for both adults and children, reduced hospitalization, resulting in savings of $1.16 to $4.51 on every invested dollar.

Implementation of Connecticut's Mobile Crisis

Connecticut's Mobile Crisis Intervention Service (Mobile Crisis) program, which is grant-funded by the Department of Children and Families (DCF), was first implemented in 2002 (O'Brien, Mulkern, & Day, 2003; Vanderploeg, Lu, Marshall, & Stevens, 2016). The program aims to "serve children in their homes and communities, reduce the number of visits to hospital emergency rooms, and divert children from high-end interventions (such as hospitalization or arrest) if a lower level of care is a safe and effective alternative" (Vanderploeg et al., 2017, p. 6). The program provides free services to youth who are 18 years and younger, and to 19 year-olds who still attend high school (Vanderploeg et al., 2016).

Vanderploeg et al. (2016) described three key components and other integral features that comprise Mobile Crisis. The information contained in the following section was adapted from their article. The first key component is the provider network. Mobile Crisis provides coverage to the entire state of Connecticut through six service areas, each of which utilizes up to three sites (there were a of 14 provider sites as of 2016; these numbers expanded, as indicated in Section III), that are responsible for different geographic regions of the state. Each service area has a Mobile Crisis director, access to a child and adolescent psychiatrist, and Master's level clinicians in the fields of social work, psychology, marriage and family therapy, and related fields. Mobile Crisis clinicians work with clients to develop crisis safety plans. Other features of their work include "crisis stabilization and support, screening and assessment, suicide assessment and prevention, brief solution-focused interventions, and referral and linkage to ongoing care" (Vanderploeg et al., 2016, p. 106). The Mobile Crisis team's approach is guided by collaboration with families, schools, hospitals, and other providers. The maximum Mobile Crisis episode length is typically 45 days, but can be extended if necessary. Clients can also return to Mobile Crisis as many times as needed after the episode is closed.

The second key component is the call center. Clients can access Mobile Crisis services by dialing 211 (although our focus groups revealed that there were direct lines of engagement at some sites). A call specialist will solicit basic information from the caller and refer police or ambulances services if warranted. Otherwise, if the call occurs during Mobile Crisis mobile hours (Monday through Friday: 6:00 am-10:00 pm; weekends and holidays: 1:00 pm-10:00 pm), the call specialist will connect the caller to Mobile Crisis through a warm transfer. Based on the call specialist's recommendation, Mobile Crisis will respond in one of three ways: immediate mobile, deferred mobile, or telephone. In mobile responses, Mobile Crisis clinicians will meet clients wherever they are experiencing a crisis in the community. During immediate mobile responses, clinicians will meet the client within 45 minutes of the call (In 2015, Mobile Crisis achieved this response time 89% of the time.). If the call occurs outside of Mobile Crisis mobile hours, the call specialist will connect the caller to a non-Mobile Crisis clinician and Mobile Crisis will follow-up with the caller during mobile hours.

The third key component is the Performance Improvement Center (PIC), which was created in 2009 and is housed at the Child Health and Development Institute of Connecticut (CHDI). PIC is charged with "standardized practice development; data collection, analysis, reporting, and quality improvement; and workforce development" (Vanderploeg, 2016, p.105). As a result of a Request for Applications (RFA) issued by the Children's Fund of Connecticut, and administered by CHDI, the current data-driven investigation was carried out to investigate Mobile Crisis impact on youth behavioral health ED use in Connecticut.

Section II: Assessing the Impact of Mobile Crisis on Subsequent ED Use

Methodological Overview

Mobile Crisis youth and the emergency department comparison group samples.

In order to gauge the impact of Mobile Crisis versus Emergency Department (ED) use on subsequent behavioral health ED service use for youth, we designed a study comparing two potentially similar groups of youth. One group received at least one Mobile Crisis service within State Fiscal Year (SFY) 2014. The other group (hereafter known as the ED comparison group or "EDCG" youth) received at least one ED service for a behavioral health-related diagnosis within the same period of time (SFY 2014), but had no Mobile Crisis visits during that fiscal year. Both groups of youth were followed subsequent to their first treatment episode within State Fiscal Year (SFY) 2014 (their 'index event') for a period of 18 months. In this follow-up period, we gathered information about whether or not there was a Medicaid claim for post-treatment behavioral health-related ED use. We also had "pre" service use data on both groups for the 18 months preceding their index event. Since service use data were based on child Medicaid claims data (Husky Health), all children in both groups had to have continuous eligibility with no more than 31 days of ineligibility during the preceding 18-month period or during the follow-up period to be included in the study. Youth in both groups were between the ages of 3 and 17 years old during the time of their index visit in SFY 2014. More details about the inclusion criteria and selection procedures for both groups are described in Appendix I**.** To summarize, the two main groups employed in our analyses are broadly described as:

- Mobile Crisis Sample (n=2532): These are youth who received Mobile Crisis services during SFY 2014 who were followed up for a period of 18 months after their first (index) 2014 episode ended.
- EDCG Sample (n=3961): These are youth who had at least one behavioral health ED visit during SFY 2014 and no Mobile Crisis visit during that time; they were also followed for a period of 18 months after their first (index) 2014 ED episode.

Propensity score analysis.

Recognizing that these two samples are in some ways very different and that potential differences in outcomes may be a function of those group differences, direct comparisons of outcome between samples may be problematic. Indeed, differences in outcome may be impacted by what researchers call "selection bias" (Shadish, Cook, & Campbell, 2002) since there is the potential that those who are identified in one group may be potentially less "severe" on behavioral risk measures, and therefore less at risk for subsequent ED use in the follow-up. One potential strategy for conducting analyses while addressing this bias is called "propensity score matching" (PSM; also called "propensity score analysis"; e.g., Austin, 2011; Guo & Fraser, 2015). The basic idea behind this is to create a score for each individual (a "propensity score") that is the probability of being in the intervention group (Mobile Crisis sample) based on a set of predictors where Mobile Crisis status (i.e., whether or not one actually is in the Mobile Crisis sample) is the dependent variable.

Quintile stratification.

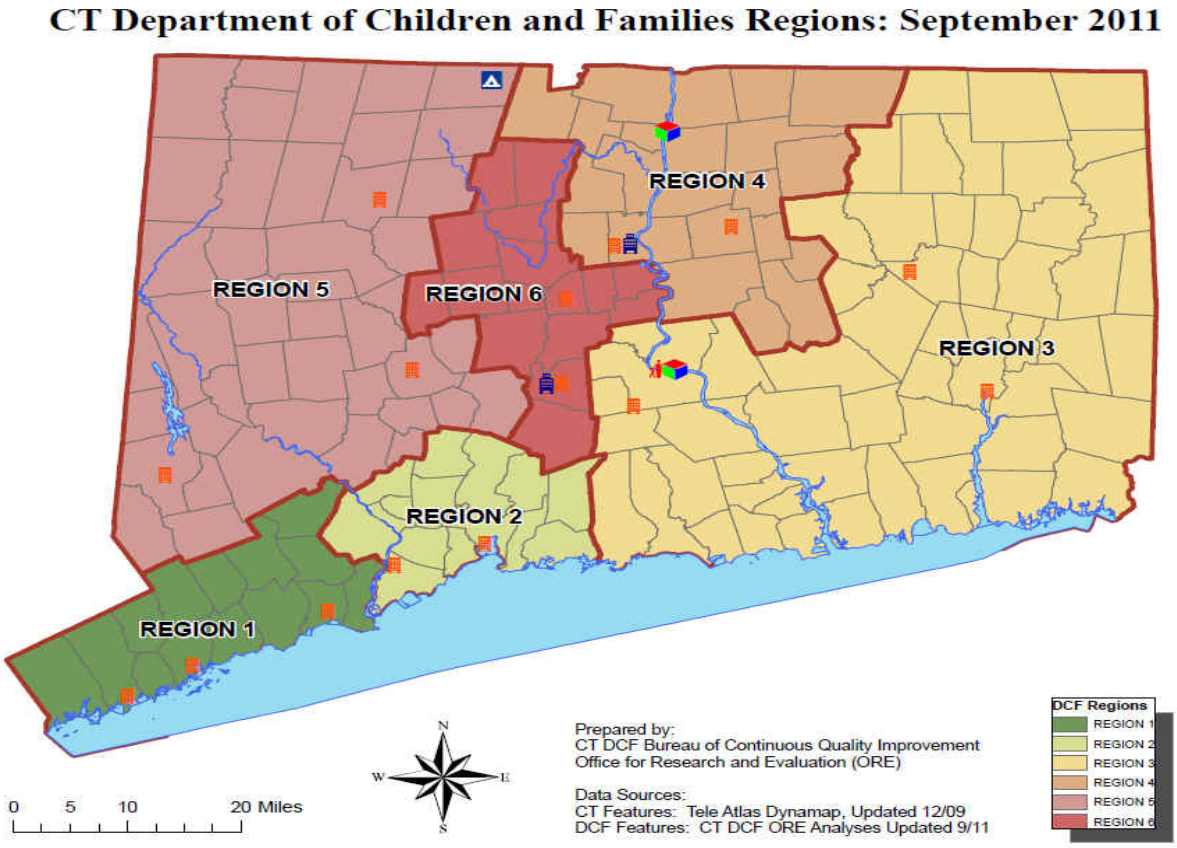
In this analysis, all individuals receive a propensity score irrespective of their actual group membership (Mobile Crisis or EDCG) based on their characteristics (the value of the covariates, listed below, included in the group membership prediction model). Individuals are grouped into one of five "quintiles" based on their score and separate regression models are evaluated within each quintile (stratified regressions) where one of two main dependent variables of interest (Number of Behavioral Health ED Visits in the follow-up period; Any Behavioral Health ED Visits in the follow-up period) are regressed on the actual group assignment (Mobile Crisis vs. EDCG).

Propensity analysis variables.

In order to match the two samples in our analysis, we had to select a group of variables that might be predictive of being seen by the Mobile Crisis. These are essentially the variables in the predictive model for Mobile Crisis sample membership. The variables included for the predictive model of Mobile Crisis status were as follows:

- Region where a child resided during his or her index episode: a child could reside in one of six DCF regions (see map, Figure 2.1, below for DCF region locations).
- Race/ethnicity: Youth were divided into one of four race/ethnicity groups: Non-Hispanic White, Non-Hispanic Black; Hispanic; & Other (those who were missing on Race in the Mobile Crisis group received an imputed race/ethnicity classification in order to compute the propensity score; see Appendix I for methods used for imputation).
- Gender.
- Age: for Mobile Crisis: at end of index episode; for EDCG: at the time of the ED visit.
- Diagnosis: We derived six diagnostic categories based on the Medicaid claims data set: 1) Anxiety Disorder; 2) Attention Deficit Disorder; 3) Conduct/Disruptive Behavior Disorder; 4) Depression; 5) Other Mood Disorder; and 6) "Low Prevalence (<15%)" Disorders. Note that, in these data, a youth could have more than one diagnosis listed as they were not mutually exclusive categories.
- Number of prior behavioral health-related ED visits.

Figure 2.1
Connecticut DCF region map



Between-group Differences on Key Variables

As Table 2.1 suggests, the two groups differed in terms of region, with the Mobile Crisis sample over-represented in Region 1 (or "Southwestern," which includes the major city of Bridgeport) and Region 4 (which contains the major city of Hartford). The EDCG sample was over-represented in Region 3 (or "Eastern"), which is Connecticut's most rural region. The Mobile Crisis sample had higher percentages of non-Hispanic Blacks and Hispanics relative to the EDCG sample. There were relatively more females than males in the Mobile Crisis sample than in the EDCG sample. The age at index episode was slightly younger for the Mobile Crisis sample (but the mean age included 12 years for both groups). There were significantly higher rates of adjustment disorders, depression, other mood disorders, in the Mobile Crisis sample. The EDCG sample had higher rates of low prevalence diagnoses. The mean number of pre-index episode behavioral health visits was higher in the Mobile Crisis sample than in the EDCG sample (.36 vs. 1.01). Just over one in five EDCG sample youth had any prior behavioral health related ED visit compared to just over two in five Mobile Crisis youth. Thus, in addition to demographic differences, there were clear clinical differences between the samples, with the Mobile Crisis group showing more extensive prior mental health service use and mental health service need.

Table 2.1

Distribution of key variables for Mobile Crisis vs. EDCG samples

		Mobile Crisis Sample (N=2532)		**EDCG Sample** (N=3961)		
		N (Mean)	% (SD)	N (Mean)	% (SD)	
Region	Southwestern	441	17.4%	471	11.9%	***[1]
	New Haven	308	12.2%	605	15.3%	
	Eastern	281	11.1%	927	23.4%	
	Hartford	789	31.2%	876	22.1%	
	Western	359	14.2%	644	16.3%	
	Central	354	14.0%	438	11.1%	
Race[2]	Non-Hispanic White	811	33.2%	1538	38.8%	***
	Non-Hispanic Black	490	20.3%	489	12.3%	
	Any Hispanic	965	39.9%	1158	29.2%	
	Other	160	6.7%	776	19.6%	
Gender	Male	1241	49.0%	2187	55.2%	***
	Female	1291	51.0%	1774	44.8%	
Age		(12.20)	(3.377)	(12.60)	(3.654)	***
Diagnosis[3]	Adjustment Dx	407	18.4%	197	5.0%	***
	Anxiety Dx	547	21.6%	936	23.6%	
	ADD, CD, & Disrupt. Dx[4]	920	36.3%	1498	37.6%	
	Depression Dx	667	26.3%	680	17.2%	***
	Other mood Dx	492	19.4%	627	15.8%	***
	Low Prevalence Dx[5]	410	16.2%	1372	34.6%	***
Number BHED pre index episodes		(1.01)	(1.794)	(0.36)	(0.880)	***
Any BHED pre index episode		1134	44.8%	864	21.8%	***

[1]***=differences between groups are significant at p<.001

[2]128 Mobile Crisis youth were missing on race

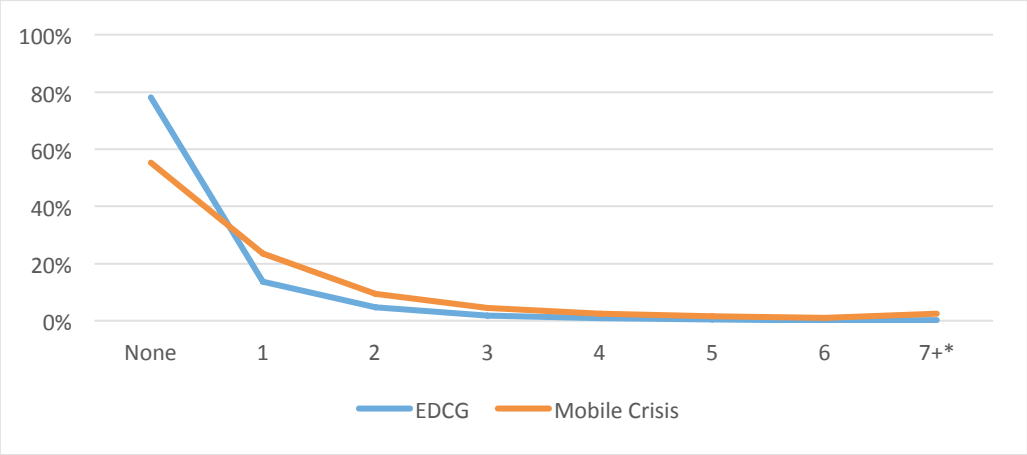
[3]Diagnoses are based on CCS codes, which involved recoding of ICD-9 classifications; diagnoses are not mutually exclusive

[4]ADD=attention-deficit disorder; CD=conduct disorder; Disrupt. Dx=disruptive behavior disorder

[5]Low Prevalence Dx combines all diagnostic categories indicating <18% prevalence for sample

The between-group differences with respect to service use are further illustrated (Figure 2.2) by the frequency distribution of prior behavioral health ED visits across the two samples. The range of visits varied widely across the two groups—from 0 to 18 for the Mobile Crisis sample and 0-10 for the EDCG sample. (Note that the tail end of the figure is truncated to 7+ visits). The curve for the EDCG drops sharply after "No visits", while the Mobile Crisis group levels off more slowly, suggesting that multiple previous visits to the ED were more common for Mobile Crisis youth (see Figure 2.2).

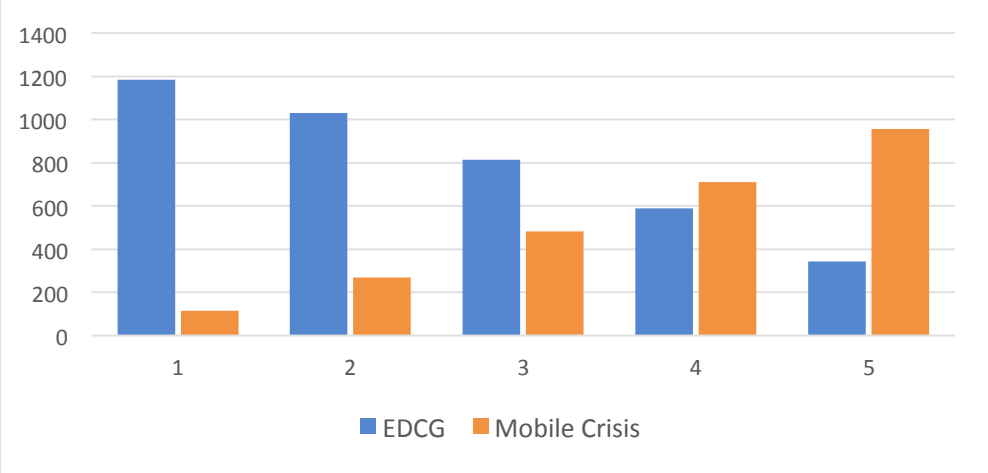
Figure 2.2
Number of pre-index episode behavioral health ED visits by sample.



Evaluation of Matching

As the next step, we investigated the effectiveness of our matching strategy. Figure 2.3 shows the frequency by sample within each of the quintiles. As a reminder, a quintile value is based on the probability of group membership (generated from the regression model predicting Mobile Crisis status). Thus, those in the first quintile have the lowest probability of group membership and those in the fifth quintile have the highest probability of group membership. As might be expected, EDCG sample youth are markedly over-represented in the first quintile, where there are relatively very few Mobile Crisis youth (N=116). Mobile Crisis youth are over-represented in the fifth quintile (N=955).

Figure 2.3
Distribution of EDCG and Mobile Crisis youth by propensity score quintile



It is reassuring to note that both samples are represented in all five quintiles, suggesting that valid comparisons are possible. We examined whether the differences shown on Table 2.1 persisted when comparisons were stratified within quintile. The only variable where significant differences remained within quintiles was the number of Pre-Index Episode Behavioral Health ED visits. Accordingly, we retained this variable as a covariate predictor in subsequent outcome analyses within quintiles.

Propensity Matching – Outcome Analyses within Quintiles

Binary Measure: Any Post-index Episode BHED Use.

Overall, both the Mobile Crisis sample and the EDCG sample youth had relatively high rates of post-index episode behavioral health ED visits (BHEDPOST). As shown on Figure 2.4, the 43.5% of the Mobile Crisis youth and 46.1% of EDCG youth had any BHEDPOST.

Figure 2.4
Distribution post-index episode BH ED visits by group

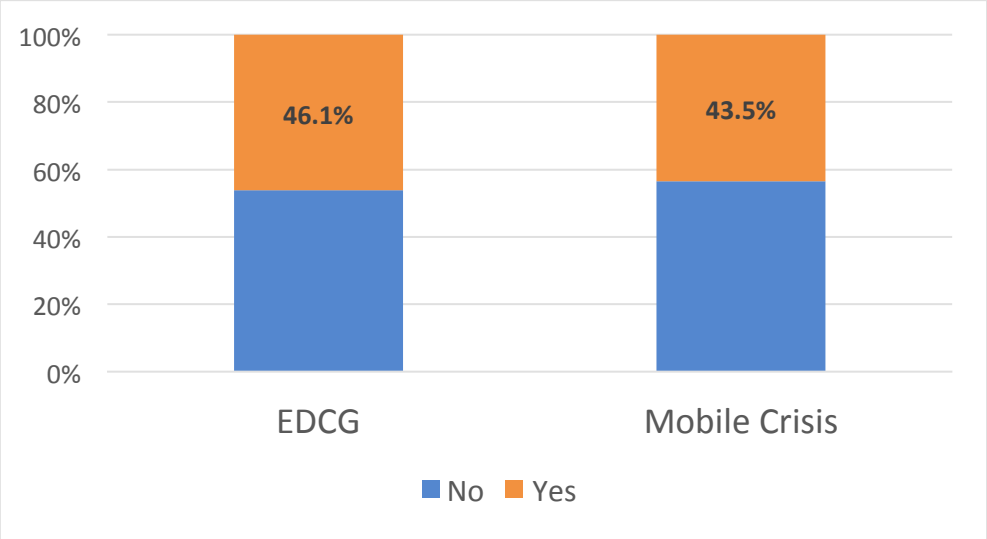
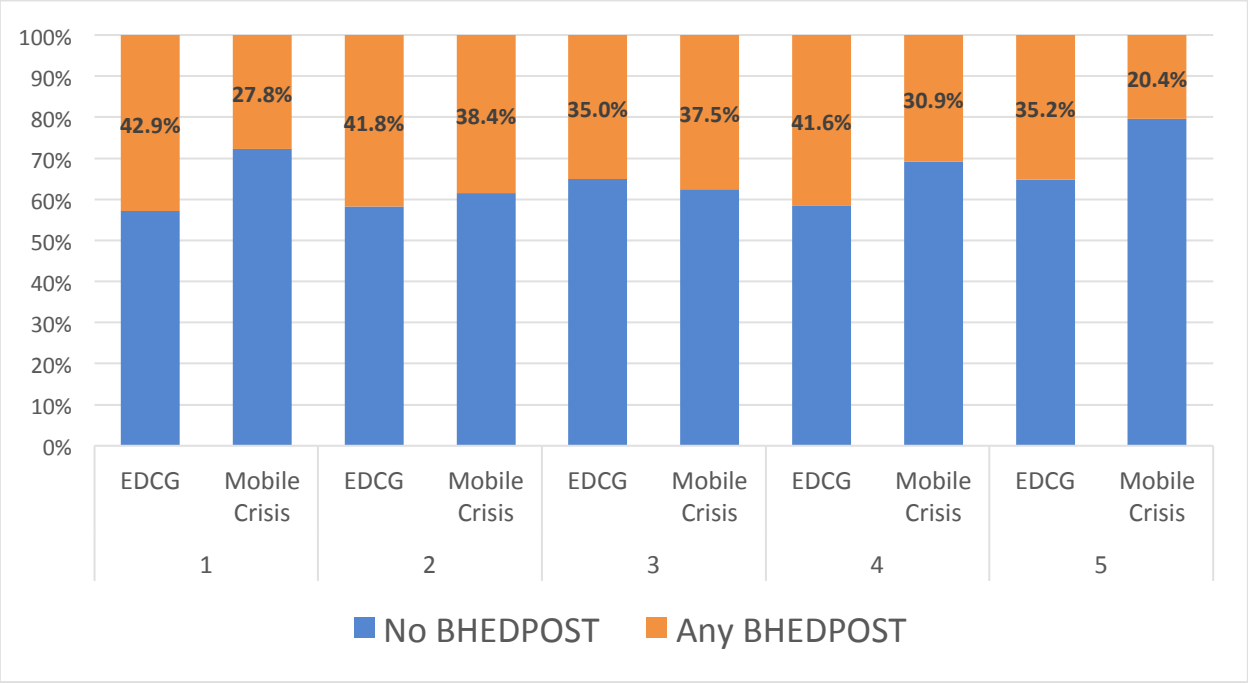


Figure 2.4 above does not consider the comparability of the two samples (the propensity scores) nor does it consider the potential impact that prior behavioral health ED visits may have on outcomes. Accordingly, constructed comparisons within each propensity score quintile group were stratified by prior behavioral health ED visit status. These are shown on Figures 2.5a and 2.5b on the following page.

We see that rates of Post Episode ED visits are substantially lower in all of the quintiles and across both samples in Figure 2.5a, compared to Figure 2.5b. In Figure 2.5a, where all youth have no previous behavioral health ED episodes, ED visit rates range from a low of 20.4 % (Mobile Crisis youth in the fifth quintile) to a high of 42.9% (EDCG sample youth in the first quintile). In this subgroup, the Mobile Crisis sample has a nominally lower rate of BHEDPOST visits than the EDCG sample youth in every quintile except the third.

Figure 2.5a

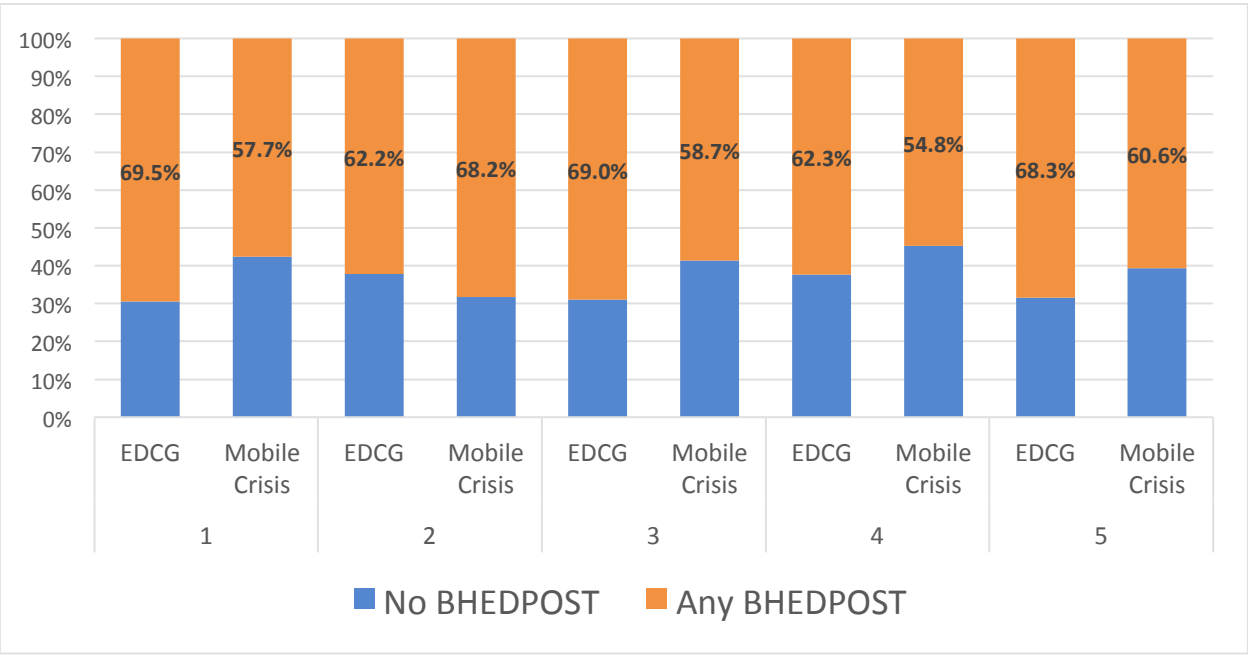
Any post-episode BH ED visits by sample for youth with no prior behavioral health ED visits



In Figure 2.5b, showing the subgroup where all youth have at least one previous behavioral health ED episode, ED visit rates range from a low of 54.8% (Mobile Crisis youth in the fourth quintile) to a high of 69.5% (EDCG youth in the first quinitile). In the subgroup with prior ED episodes (Figure 2.5b), the Mobile Crisis sample also has a nominally lower rate of BHEDPOST visits in every quintile except the second.

Figure 2.5b

Any post-episode behavioral health visits by sample for youth with any prior behavioral health ED visits

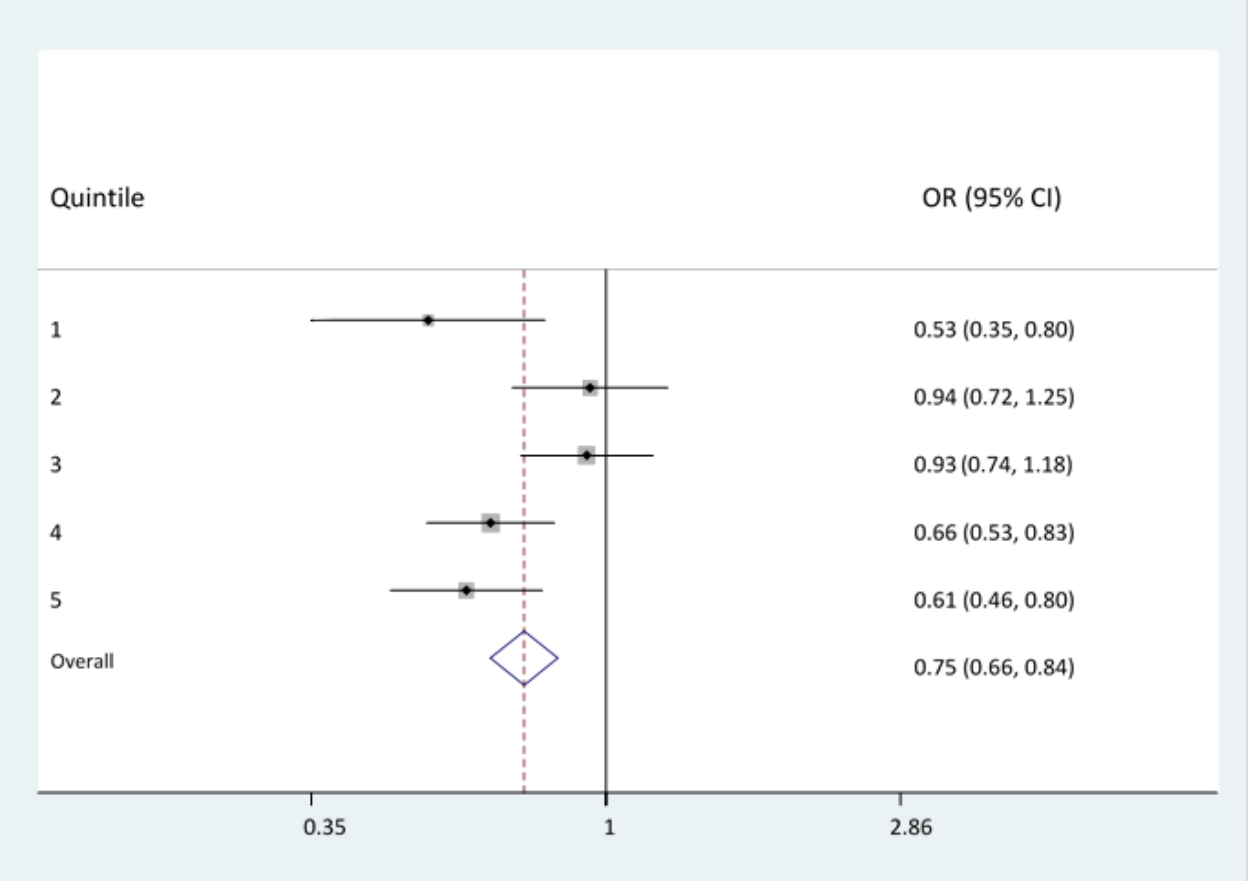


Main Propensity Analyses within Quintiles.

Following up on these descriptive analyses, we conducted a series of logistic regressions predicting whether a youth had any BHEDPOST. In each model, Mobile Crisis status was a predictor and we controlled for whether or not there was any prior ED behavioral health episode. These regression models were stratified within each quintile. Regression models yielded significant odds ratios in three of the five quintiles (quintiles 1, 4, and 5), suggesting a trend toward a reduction in the risk for subsequent ED visits. The reduction in risk is illustrated in Figure 2.6, where point estimates for odds ratios (squares with dots) are all to the left of the value of one (the value suggesting no group differences). Lines displaying the 95% confidence intervals are also positioned horizontally to the left of the bar connoting the value of one for the first, fourth, and fifth quintiles. The biggest decrease in risk is in the first quintile (with an odds ratio of .53); the odds ratios are .66 and .61, respectfully, for the fourth and fifth quintiles. The overall odds ratio, indicated by the diamond is a value of .75 (with a 95% confidence interval from .66 to .84), suggesting that overall, those in the Mobile Crisis sample have a 25% reduction in the risk for a subsequent ED visit.

Figure 2.6

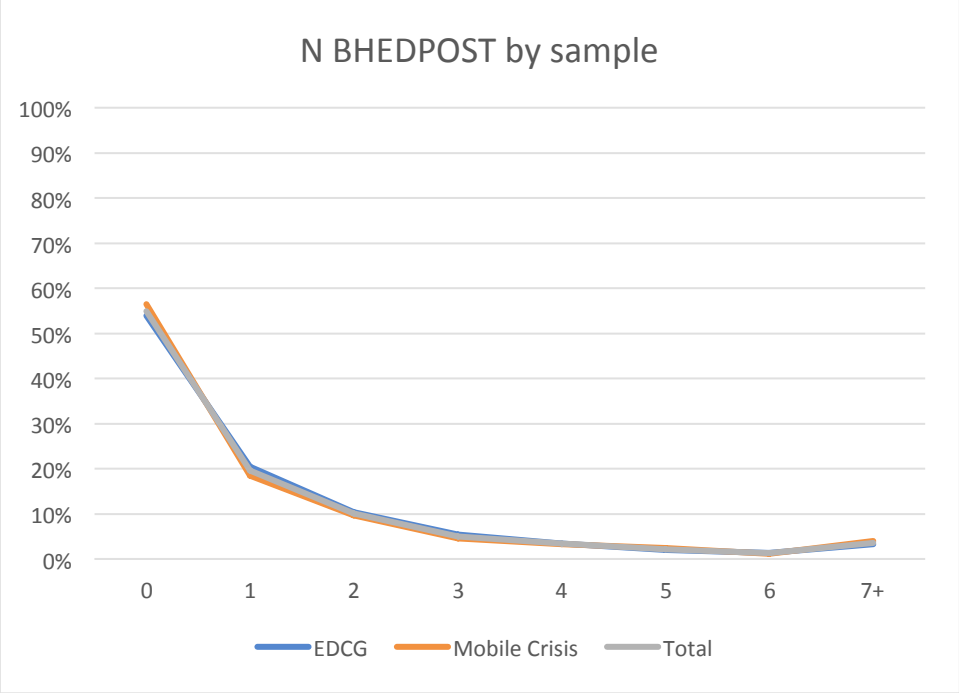
Odds ratio (OR) of any post episode ED use within quintile and overall (controlling for any prior behavioral health ED use), Mobile Crisis vs. EDCG sample



Continuous Measure Outcomes: Number of Behavioral Health ED Visits Post-index Episode

A second set of propensity analyses examined the number of BHEDPOST as an outcome. Note that the number of ED visits during the 18-month follow-up period across the two samples ranged from 0 to 39 (the range for the Mobile Crisis youth was from 0-32 visits; the range for EDCG youth was from 0-39 visits). The frequency distribution, by sample, is summarized below in Figure 2.7. Note that the two samples showed quite a bit of overlap (also note that the tail end of the figure is truncated to 7+ visits). For both samples, the mode and medians number of visits were "0" (i.e., no visits).

Figure 2.7
Distribution of post episode behavioral health ED visits by sample



Analogous to the comparisons for binary outcomes, we constructed box plots to display the means and ranges in values for post episode visits for the Mobile Crisis and EDCG sample youth for in each propensity score quintile. Figure 2.8 displays the box plots for the group without prior ED episodes. Figure 2.9 displays the plots for the group with prior ED episodes.

Figure 2.8

Number of post episode behavioral health ED visits by sample for youth with <u>no prior</u> behavioral health ED visits

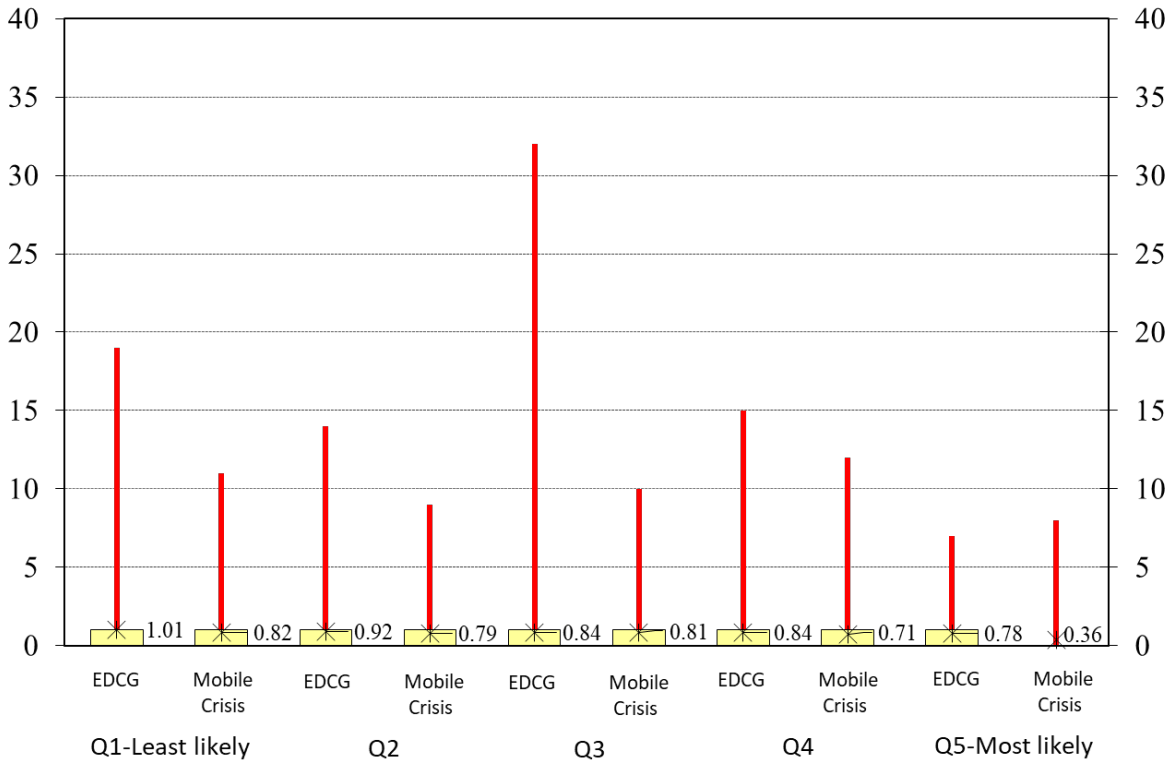
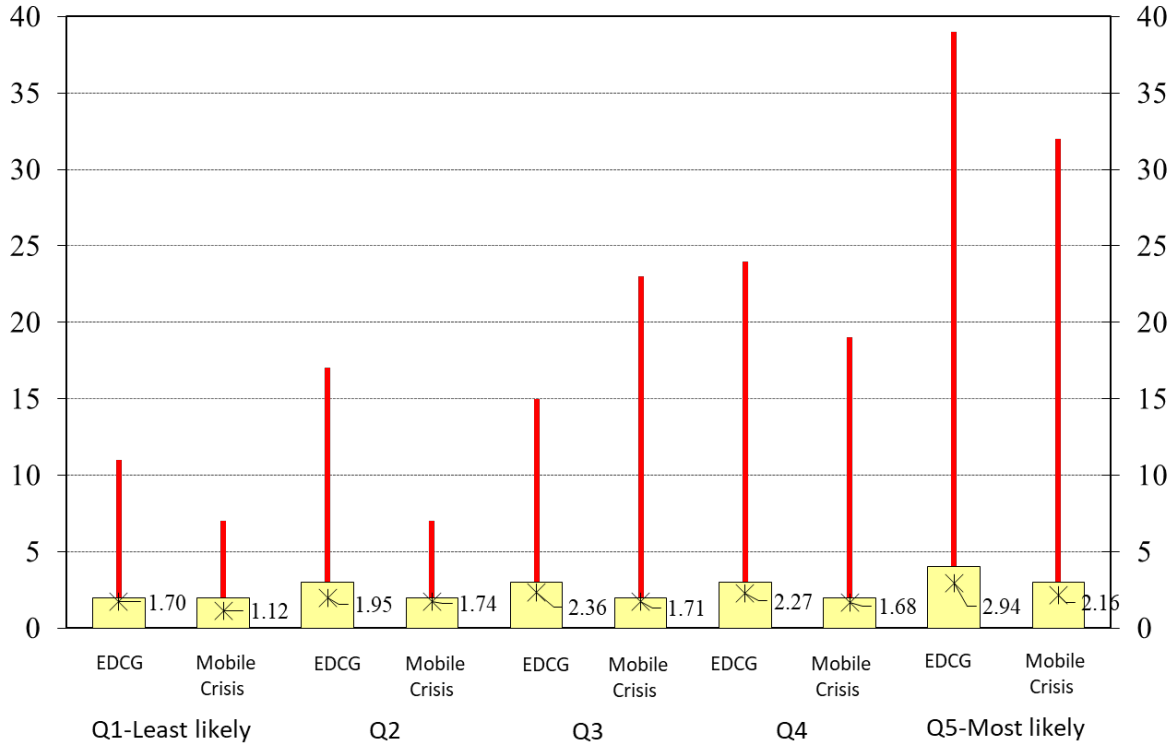


Figure 2.9

Number of post episode behavioral health ED visits by group for youth with prior behavioral health ED visits

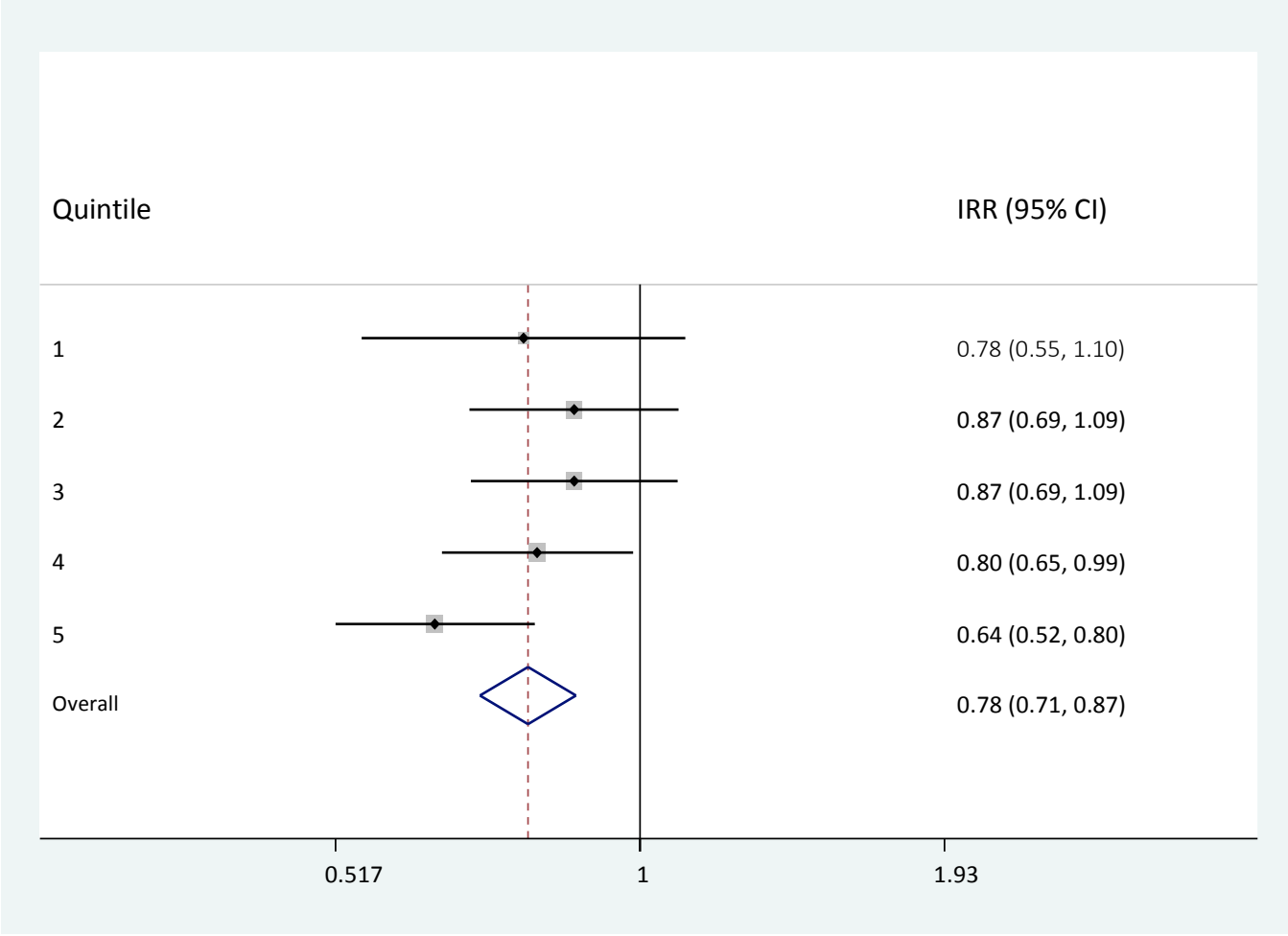


In Figures 2.8 and 2.9, the outcomes are mean number of BHEDPOST visits. In the group with **no** prior behavioral health ED visits, the means tend to be fractional – or less than one episode – for every quintile for both groups with one exception (the EDCG group youth in the first quintile, which is just above one; see Figure 2.8). In the group with **any** prior behavioral health ED visits, the means are greater than one – and, in some cases exceed two, in every quintile for both groups (see Figure 2.9). The means in the no prior episode group (Figure 2.8) range from 0.36 (the Mobile Crisis youth in the fifth quintile) to 1.01 (the EDCG group youth in the first quintile). By contrast, in the group with prior ED episodes, the mean number of visits range from 1.68 (the Mobile Crisis youth in the fourth quintile) to 2.94 (the EDCG group youth in the fifth quintile).

Main Propensity Analysis within Quintiles.

Following up on these bivariate analyses, we carried out negative binomial regression analyses stratified within propensity score quintile. The negative binomial regression models accounted for the unusual distribution of the dependent variable – a large group of subjects clustered at the value of 0, and a smaller subset distributed across a range of more extreme values (with a maximum of 39). As with the logistic models discussed above, the negative binomial models controlled for any prior behavioral health ED visit.

Figure 2.10
Negative binomial regression predicting incidence risk of post episode ED use Mobile Crisis youth vs. EDCG youth



The results of the negative binomial regression within quintile are summarized on Figure 2.10. Each horizontal line reflects the results of a separate model within each quintile. Similar to the logistic regression results, when lines are to the left of the value "1" (the vertical line) they indicate a reduction in rate of events occurring for the Mobile Crisis group. When they overlap with the value "1," they indicate no difference in rate of events occurring. Three of the lines (models from quintile one through three) overlap with the vertical line. Two of the lines are to the left of the value "1," from quintiles four and five. The pooled incidence risk is the diamond to the left of the value "1" and suggests a significant reduction in the rate of ED visits in the Mobile Crisis group vs. the EDCG group. The overall value of .78 (95% CI: .71 to .87) suggests that Mobile

Crisis sample hasa 22% reduction in the risk for newBHEDPOST visits compared to the EDCG sample. The overall effect size is statistically significant ($p < .01$). We note that this is very close in value to the overall result obtained when we examined the binary outcome variable (any BHEDPOST).

Supplementary Analysis Employing Weighted Propensity Scores via SAS

In supplementary analyses, we created propensity scores using procedures available in SAS software (using the TWANG procedure and employing all of the same matching variables that were employed in the quintile models; Griffin et al. 2014). Propensity scores were then used to weight cases in two regression models paralleling those discussed for each of the quintile models. The matching procedure suggested excellent balance on all variables except race. Consequently, the weighted regression models controlled for race/ethnicity. The overall findings from both the logistic regression (predicting the binary outcome of any BHEDPOST) and the negative binomial regression (predicting the continuous outcome of number BHED post visits) yielded results which were close to those obtained in the quintile analyses, albeit slightly more conservative. The odds ratio for the binary logistic model was .81 (95% CI: .70, .93). The incidence risk ratio for the continuous outcome was .87 (95% CI: .80, .94). This would suggest a reduction in risk of around 19% for any BHEDPOST and a 13% reduction in the rate BHEDPOST visits.

When comparing the results regarding the number of BHEDPOST to the results predicting “any” BHEDPOST, the relatively lopsided distribution of the former variable – which is essentially distributed as a negative binomial variable – creates some distortion in interpretation of quantitative change. It is sufficient to note that the differences between the propensity score matched groups are significant – and clearly suggest a benefit resulting from Mobile Crisis services – irrespective of the outcome being tested or the approach to the propensity analysis. Nevertheless, given the large range in visit counts for those Mobile Crisis youth who do end up subsequently seeking ED services, it may be helpful to begin to shift attention to examining which factors influence ED service outcomes.

Section III: Predicting Subsequent Behavioral Health ED Use in Mobile Crisis Youth: Decision Tree Analysis

As noted previously, the outcome data from Beacon Health Options contained information about service use in the 18 months after the Mobile Crisis index episode in 2014. We were interested in exploring variables associated with subsequent BHED use by Mobile Crisis youth – both in terms of any subsequent use and number of BHED episodes after the index episode. The data set provided to us by Beacon on Mobile Crisis youth contained a number of variables that were potentially useful in investigating as predictors of subsequent behavioral health ED use (BHEDPOST). Absent strong theoretical or empirical justification guiding the scope of this inquiry, and, given the availability of a number of variables for analysis, we essentially focused on trying to sort out and reduce the myriad of potential predictors. In this section, we discuss the Mobile Crisis sample used for analysis in more detail, the variable sets addressed in the analysis, the approach to variable selection in prediction, and the overall results of our analyses.

Sample Considerations

The sample employed for predicting BHED use consists of the 2,532 youth described in Table 2.1.

Outcome Measures

As in our previous propensity score analyses, the two outcome variables of interest are "any post Mobile Crisis behavioral health ED use" in the 18-month period following the index episode and "number of post-Mobile Crisis behavioral health ED episodes" in the 18-month period following the index episode. As noted previously, over half of the Mobile Crisis youth did not have a BHEDPOST episode (56%); conversely, 44% did have a BHEDPOST episode. Among those who had a BHEDPOST episode (n=1,102), over two in five (42%; n=468) had only one episode; 22% (n=245) had two episodes, and just over a third (35%; n=389) had 3 or more BHEDPOST episodes.

Predictors of Repeat ED Visits

We initially identified 78 possible predictors of BHEDPOST use. These predictors were classified into four distinct groups: Prior service use, Demographic and Background Characteristics, Child Functioning, and Mobile Crisis Episode Characteristics. Tables 3.1, 3.2, 3.3, and 3.4 summarize variables explored in relation to a binary index of BHEDPOST for each of these four categories. The tables also indicate which variables showed significant bivariate associations with ED outcomes.

Table 3.1

Associations with subsequent ED use: Variables that measure prior service use

Note: All variables related to prior service use were significantly associated with an increased likelihood of subsequent ED use

Any BH ED visits before index?

Any medical ED visits before index?

Any private inpatient visits before index?

Any state-Solnit inpatient visits before index?

Any BH services before index?

Any prior ED or Mobile Crisis visits/episodes?

Current Mobile Crisis client?

In 6 months prior to index, any evaluation at ED for psych/BH reasons?

In lifetime, any admission to hospital for psych/BH reasons?

In 6 months prior to index, any admission to hospital for psych/BH reasons?

In lifetime, any placement in an out-of-home setting for psych/BH reasons?

In 6 months prior to index, any placement in in an out-of-home setting for psych/BH reasons?

Table 3.2

Associations with subsequent ED use: Variables that measure demographic and background characteristics

Significantly correlated with ↑ BHEDPOST	**NOT correlated with ↑ BHEDPOST**
Age (older)	Sex
Race (White, non-Hispanic)	Parent/guardian service needs identified
Primary language in home: English	
Region (Eastern)	
Not TANF Eligible	
DCF Status at Intake	
Non-private residence at Intake	
Parent/guardian rating of child's school attendance[1]	
Ohio Caregiver stress level[2]	

[1]12 months prior

[2]Intake version used. If missing intake version, discharge version was used

Table 3.3
Associations with subsequent ED use: Variables that measure child functioning

Significantly correlated with ↑ BHEDPOST	NOT correlated with ↑ BHEDPOST
Arrests in past year at intake	Dx of delirium, dementia, other cognitive disorders
Meets criteria for Serious Emotional Disturbance	Impulse control disorder Dx
Dx is not Adjustment Disorder	Personality disorder Dx
Has an ADD, CD, or Disrupt. Dx[1]	Schizophrenia/psychotic disorder Dx
Has a developmental disorder Dx	Alcohol-related disorder Dx
Has a Dx usually diagnosed in youth	Substance-related disorder Dx
Has a bipolar/manic Dx	Screening or History of MH and SA codes Dx
Has an 'other mood disorder' Dx[2]	Miscellaneous MH disorder Dx
Has a non-depression mood disorder	Depression Dx
Has an Autism Spectrum disorder	Any axis 1 or 2 Dx of BH
Axis 5 Dx at intake (lower)	Alcohol or drug problem at discharge
Lifetime: problem w/alcohol or other substances	
Prior 6 months: alcohol/other substance problem	
OSWR[3]: Functioning (lower)	
Any traumatic history reported	
# of types of trauma reported (higher)	
Any school issues at intake or discharge	
# of school issues reported (more)	

[1]ADD attention-deficit disorder; CS=conduct disorder; Disrupt. Dx= disruptive behavior disorder
[2] Other mood disorder=Mood disorder other than depression/bipolar/mania
[3]OSWR=Ohio Scales Worker rating

Table 3.4

Associations with subsequent ED use: Variables that measure Mobile Crisis episode characteristics

Significantly correlated with ↑ BHEDPOST	**NOT correlated with ↑ BHEDPOST**
Referral source (ED)	# mobile contacts during episode
Mobile Crisis 1st contact (non-mobile)	Referred to resident treatment
No office visits during episode	Referred to intensive outpatient treatment
# care referrals received	Referred to extended day treatment
Response time (shorter)	Referred to care coordination
Community Partner Agency (UCFS)	Referred to other out-of-home treatment
OSWR[1]: Problem severity	Referred to other community-based treatment
Referred to inpatient (yes)	
Referred to group home (yes)	
Referred to partial hospital program (yes)	
Referred to outpatient services (no)	
Length of stay (shorter)	
Did not 'complete treatment'	

[1] OSWR=Ohio Scales Worker rating

Clearly, there were a number of variables in each of the categories that predicted subsequent ED service use. Strikingly, all of the prior service use variables were significant predictors. In other words, a youth who had any prior service use (as measured by twelve different variables) was at greater risk for BHEDPOST. Given the many variables to consider here, we decided to use a Regression Tree Modeling approach to select the best predictors. We used SPSS 25 Decision Tree "Classification and Regression Tree" (C&RT) analysis (Brieman, et al., 1984) to identify the best predictors for a) Any BHEDPOST and the b) number of BHEDPOST. The C&RT method is nonparametric and thus neither relies on a specific distribution nor is beholden to outliers. C&RT does not restrict the use of variables, but allows the same variable to be used in different parts of the tree, allowing for a better description of the complex interdependencies between predictors.

After examining the initial results of the decision trees that used all 78 variables listed above (predicting ANYBHPOST and NBHPOST), we were able to identify variables that should be revised or excluded from the final decision tree analyses due to redundancy, low prevalence, or limited importance. Since all the prior service use variables were significant predictors, we combined the individual use reports for the 18-months prior to the index episode into a single variable with three categories: No prior service use (54%), Either BHED or BH Inpatient (30%), or Both BHED and BH Inpatient (16%) prior service use. DCF status at intake was

grouped into a binary indicator (DCF vs. not DCF) since 80% of the sample were not DCF youth at intake. For diagnosis, we used the same indicator for any low prevalence diagnosis as used in the propensity score analysis rather than the several individual indicators. Primary presenting problem was grouped into a categorical variable with three categories: Internalizing problem (50%), Externalizing problem (36%), or Other (14%); 33 youth (0.08%) were missing primary presenting problem. Referral source was grouped into four categories: School (40%), Self/Family (36%), ED (11%), and Other (13%). For variables that represented redundancies, the best predictor was selected by identifying the value that had the most valid responses, represented the same time period as the outcome variables, or represented greater importance in the initial decision tree runs. The final decision tree analyses included 43 variables including: 3 Prior service use, 11 Demographic and Background Characteristics, 14 Child Functioning, and 15 Mobile Crisis Episode Characteristics (see Table 3.5).

Table 3.5
Final 43 variables by domain for C&RT analysis

Prior service use	Demographic/background	Functioning	MCEP[1] characteristics
Prior BH ED/inpatient use	Sex	Arrested in past year	Referral source
# of prior MCEPs	Age	Meets criteria for SED[4]	Mobile Crisis response mode
Current Mobile Crisis client?	Race	Adjustment disorder Dx	# of mobile contacts during ep
	Private residence	Anxiety Dx	# of office visits during ep
	Primary language in home	ADD, CD, or Disrupt. Dx[5]	# of care referrals received
	Region	Depression Dx	Response time
	TANF eligibility	Other mood disorder Dx	Community Partner Agency
	DCF/not DCF status	Low prevalence Dx	Primary presenting problem
	P/G[2] rating of school attend.	GAF[6] (Axis V)	OS WR: Problem Severity
	# of P/G service needs	Substance problem[7]	Referred to other community-based tx
	OS[3]: Caregiver stress level	OSWR[8]: Functioning	Referred to inpatient
		Any traumatic history	Referred to IOP[9]
		Any school issues	Referred to intensive in-home tx
		OSWR[8]: Problem severity	Referred to outpatient tx
			Length of stay
			Discharge due to completed tx

[1]MCEP=Mobile Crisis episode
[2]P/G=Parent/guardian; rating of child's school attendance 12 months prior
[3]OS=Ohio Scales
[4]SED=Serious Emotional Disturbance
[5]ADD=attention-deficit disorder; CD=conduct disorder; Disrupt. Dx=disruptive behavior disorder
[6]GAF=Global Assessment of Functioning
[7]Lifetime problem with alcohol or other substance
[8]OSWR=Ohio Scales Worker rating
[9]IOP=intensive outpatient treatment

Overall Results

Figure 3.1 shows the results from the C&RT decision tree predicting Any BHEDPOST. A total of 10 variables of the 43 included were identified as predictors of having any BHEDPOST. These included variables from each of the four domains. In the Prior Service Use domain, all three variables (prior BHED/inpatient use, the number of prior Mobile Crisis episodes, and current Mobile Crisis client status) were predictors. In the Demographic/background domain, race, and region were predictors. In the Child Functioning domain, adjustment disorders diagnosis, and Ohio Scales worker rating for functioning were predictors. In the Episode Characteristics Domain, only two variables (Ohio Scales worker rating for problem severity and length of stay) were predictors. It should be noted that the single best predictor overall was prior service use. Looking at Figure 3.1, the first split in the tree differentiates between those with no prior service use and those with prior BHED, prior inpatient history, or both. Nearly three out five Mobile Crisis youth (59%) with one of those prior service experiences in the 18 months preceding the Mobile Crisis index episode subsequently experience an ED admission in the 18 month follow-up period. This compares with just 30% of the youth who do not have this service use history.

Overall Tree Output

C&RT analysis produces terminal modes – or stopping points in the tree development process. These stopping points are useful for summarizing combinations of characteristics, which potentially increase or decrease the probability of outcomes. The 14 terminal nodes (along with their corresponding numbers on Figure 3.1) produced from these analyses are summarized in Table 3.6. Nodes above the line on Table 3.6 describe combinations of characteristics that increase the risk for subsequent ED visits. Nodes below the line describe combinations of characteristics that decrease the risk for subsequent ED visits. All of the four terminal nodes with no prior service use (nodes 6, 11, 19, and 20) are below the line in Table 3.6. Conversely, all of the four terminal nodes with both BHED and inpatient prior service use (nodes 9, 18, 25, and 26) are above the line, including the three of the four nodes with the most increased risk for a BHED visit in the 18 month follow-up period.

Accordingly, the combination of characteristics that most increases risk (node 26) would be a youth with both a prior BHED visit and an inpatient stay, who is not from the Southwest region of the state, who does not have a depression diagnosis, and who has one or more prior Mobile Crisis episodes. Over four-fifths of this group (85.5%) had a subsequent BHED visit in the 18-month follow-up period. This very high-risk group in node comprised only 4.9% (n=124) of the 2532 Mobile Crisis youth in the sample.

In contrast to node 26, those in node 11 had a combination of characteristics that considerably reduced their risk for a BHED visit in the 18-month follow-up period. Youth in this group had no prior service use, had an Ohio Scale Worker problem severity rating of less than 31, and an adjustment disorder. Only 16% of youth in this group, which comprised 10.2% (n=257) of the sample, had any BHED visit in the follow-up period.

Figure 3.1

CRT Decision Tree predicting any BHED post-index (43 variables)

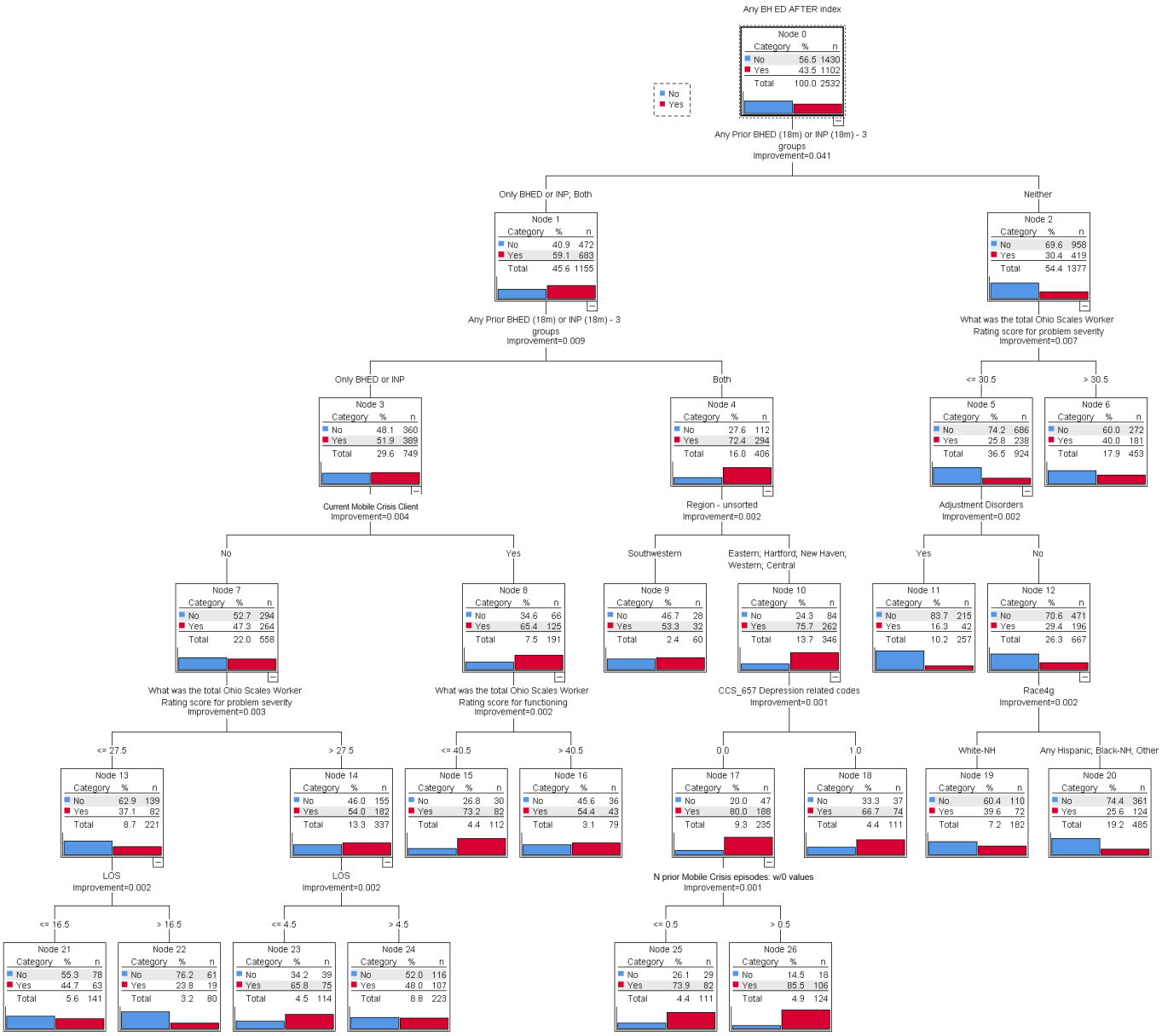


Table 3.6
Description of terminal nodes of decision tree predicting any BHEDPOST

Above line: increased risk of Any BHEDPOST (1075, 42.5%)
Below line: decreased risk of Any BHEDPOST (1457, 57.5%)
Italics=smallest group; **Bold=largest group**

Description of Terminal Node	Gains for Terminal Nodes						
		Node		Gain		Response	Index
	Node	N	% of total	N	% of all BHED POST	% BHED POST within Node	Response*
Both BHED+INP prior, not SW Region, Not Depression Dx, Any prior Mobile Crisis ep.	26	124	4.9%	106	9.6%	85.5%	196.4%
Both BHED+INP prior, not SW Region, Not Depression Dx, NO prior Mobile Crisis ep.	25	111	4.4%	82	7.4%	73.9%	169.7%
Either BHED or INP prior, Current mobile crisis client, OSW: Funct. <41	15	112	4.4%	82	7.4%	73.2%	168.2%
Both BHED+INP prior, Not SW Region	18	111	4.4%	74	6.7%	66.7%	153.2%
Either BHED or INP prior, Not current mobile crisis client, OSW Prob Sev 28+, LOS <5 days	23	114	4.5%	75	6.8%	65.8%	151.2%
Either BHED or INP prior, Current Mobile Crisis client, OSW: Funct. 41+	16	79	3.1%	43	3.9%	54.4%	125.1%
Both BHED+INP prior, SW Region, Depression Dx	*9*	*60*	*2.4%*	*32*	*2.9%*	*53.3%*	*122.5%*
Either BHED or INP prior, Not current mobile crisis client, OSW: Prob Sev 28+, LOS 5+ days	24	223	8.8%	107	9.7%	48.0%	110.2%
Either BHED or INP prior, Not current mobile crisis client, OSW: Prob Sev<28, LOS <17 days	21	141	5.6%	63	5.7%	44.7%	102.7%
No Prior, OSW: Prob Sev 31+	6	453	17.9%	181	16.4%	40.0%	91.8%
No Prior, OSW: Prob Sev< 31, Not Adjustment DO, Race: White-NH	19	182	7.2%	72	6.5%	39.6%	90.9%
No Prior, OSW: Prob Sev <31, Not Adjustment DO, Race: Not White-NH	**20**	**485**	**19.2%**	**124**	**11.3%**	**25.6%**	**58.7%**
Either BHED or INP prior, Not current mobile crisis client, OSW: Prob Sev<28, LOS 17+ days	22	80	3.2%	19	1.7%	23.8%	54.6%
No Prior, OSW: Prob Sev<31, Adjustment DO	11	257	10.2%	42	3.8%	16.3%	37.5%
	Total	2532	100%	1102	100%	43.5%	100%

**Index= Response within Node divided by Total Response*
Growing Method: CRT; Dependent Variable: Any BH ED AFTER index

Follow-up Logistic Regression Analyses

As a follow up to the analyses described, we conducted a logistic regression analysis that included the 10 variables identified in the tree as predictors of any post episode BHED visits in the 18-month follow-up period (See Table 8). Prior service use was entered as a three-category variable: No prior service (the reference group); either BHED or BH Inpatient service; and both BHED and Inpatient service. Region was entered as a six-category dummy variable with Hartford as the reference category. Race was entered as a four-category dummy variable with White as the reference category. Depression and adjustment disorders were each entered as two-category dummy variables (with no depression and no adjustment disorders, respectively as the reference categories). The Ohio Scales Worker rating for problem severity, the Ohio Scale Worker rating for functioning, number of prior Mobile Crisis episodes, and length of stay for the index episode were all entered as continuous measures in the model.

The logistic regression models slightly diverged from the C&RT analysis, as variables from three of the four domains predicted subsequent BHED admissions. In the Prior Service Use domain, two variables, Prior BHED/Inpatient and Current Mobile Crisis client status both increased the risk of subsequent BHED admission. In the Child Functioning domain, the Ohio Scales Worker rating of problem severity (higher scores indicated more problems) and Adjustment Diagnosis both affected the risk of subsequent BHED visits. The former variable increased the odds of a subsequent visit and the latter variable decreased the odds of a subsequent visit. In the Episode Characteristics domain, Length of Stay was associated with subsequent BHED visits. Those with a longer length of stay in their Mobile Crisis index episode had reduced odds of a subsequent BHED visit in the 18-month follow-up period. Underscoring the importance of prior service use, we note that when youths experienced both a prior BHED visit *and* an inpatient stay, their odds of having a subsequent BHED visit at follow-up tripled compared to youth who had neither (OR: 3.796; 95% CI: 2.82 - 5.11; $p < .001$). We followed up this finding further by separately estimating the effect of just having a prior BHED in the 18-month period preceding the Mobile Crisis episode (given that inpatient stays were relatively rare in the sample). In the resulting logistic regression model controlling for the nine other variables (not shown here), those with a prior BHED episode had just over twice the odds of a BHED visit in the 18-month follow-up period, compared to Mobile Crisis youth who did not have any prior BHED or inpatient service use (OR: 2.060; 95% CI: 1.66- 2.56; $p < .001$).

Finally, we note (not shown here) that we looked at whether the findings for the main effects for prior service use held across race/ethnicity subgroups. In order to do this, we constructed a series of interaction terms in a subsequent logistic regression. None of these terms were significant, indicating that the findings were consistent across the different race/ethnicity subgroups in the sample.

Table 3.7

Logistic regression summary table predicting any BHED 18 months post Mobile Crisis episode

Variable		Odds Ratio	Lower 95%	Upper 95%	
Prior BHED/Inpatient					
	BHED or Inpatient vs. none	2.072	1.671	2.567	**[3]
	Both vs. none	3.796	2.823	5.105	
N Prior MCEPs[1]		1.087	0.994	1.189	N.S.
Current Mobile Crisis client	(y/n)	1.5783	1.242	1.992	**
Race					
	Black vs. White	0.885	0.646	1.132	N.S.
	Hispanic vs. White	0.881	0.699	1.111	N.S.
	Other vs. White	1.079	0.714	1.629	N.S.
Region					
	Eastern vs. Hartford	1.328	0.951	1.856	N.S.
	Western vs. Hartford	1.062	0.777	1.451	N.S.
	New Haven vs. Hartford	0.992	0.697	1.411	N.S.
	Southwestern vs. Hartford	0.842	0.628	1.129	N.S.
	Central vs. Hartford	1.319	0.961	1.810	N.S.
Diagnosis	Adjustment Dx (yes vs. no)	0.666	0.504	0.880	**
	Depression Dx (yes vs. no)	0.914	0.731	1.143	N.S.
OSWR[2]**: Functioning**		0.990	0.981	1.000	*[4]
OS WR: Problem Severity		1.014	1.005	1.024	**
Length of Stay (MC Ep)		0.991	0.986	0.997	**

[1]MCEP=Mobile Crisis episode

[2]OSWR=Ohio Scales Worker rating

[3]**=differences between groups are significant at p<.01

[4]*=differences are significant at p<.05

Analyses of Continuous BHED Outcomes

Additional CR&T analyses were conducted with the number of BHED visits in the 18-month follow-up period as the outcome measure. We do not show these results in this report as they are somewhat less informative. Nevertheless, it should be noted that prior service use (any prior BHED or inpatient visit in the 18 months preceding the Mobile Crisis episode) was also the major predictor of continuous outcomes. Other predictors included Mobile Crisis client status, length of stay, and the Ohio Scales worker rating for problem severity.

Section IV:

Understanding Mobile Crisis Processes & Outcomes: Provider Perspectives on Strengths and Challenges

Background and Purpose

While quantitative analyses address the effect of Emergency Mobile Psychiatric Services (Mobile Crisis) use on Emergency Department (ED) use and identify barriers and facilitators to reducing ED use, they are less able to identify nuances important to understanding how and why these findings emerge. In this third component of the study, qualitative methods were used to enhance the understanding of the relationship between Mobile Crisis and ED use. Providers were asked about program strengths, challenges, and the extent to which Mobile Crisis providers connect families to ongoing care, as well as how Mobile Crisis can be improved. Note that in this section, when summarizing direct quotes from providers, we use the original term for the crisis service, "EMPS." This label was that was the term that was used for this service when we conducted our original focus group interviews.

Methods

Between April and November 2017, focus groups were conducted with providers at seven of the nine Mobile Crisis agencies that serve the state of Connecticut. In total, 33 providers were interviewed (three to six per agency). Their average age was 33.8 years (ranged from a mean of 30.2 to 41.0 per agency). The majority were female (93.9%) and White 60.6%). Half of the participants (51.7%) were clinicians, 44.8% were supervisors or administrators, and one was a program assistant. All but one of the providers had an MSW. Of the 29 who indicated their duration of Mobile Crisis employment, 69.7% had worked for two or more years whereas the remainder had worked between six months and two years. Those who had worked for the Mobile Crisis program for less than six months were excluded from participation in the study.

A semi-structured interview guide was used to elicit the providers' description of the Mobile Crisis program's goals and methods, and service, child, and family-related factors that enhance or impede Mobile Crisis (See Appendix II). The focus groups were transcribed and coded thematically, guided by the principles of phenomenology (Padgett, 2017).

Qualitative Results

Overview of the Qualitative Results.

Overall, the qualitative data indicated that Mobile Crisis providers follow best practices with children in crisis and that providers have a high threshold for ED referral. The presence of family support greatly influenced the providers' ability to help clients. Providers, however, noted that they did face resistance at all levels. For example, some referring agencies still call 911 rather than 211, which Mobile Crisis addresses through community outreach and psychoeducation. Furthermore, private insurance often does not cover behavioral healthcare and there is a dearth of accessible treatment options for clients with some severe disorders. As such, Mobile Crisis is sometimes used as a holding environment for the severely disordered for whom access to treatment is very limited even though such an approach is beyond Mobile Crisis' scope.

The more detailed qualitative findings begin with the providers' description of Mobile Crisis and the youth typically served, as well as the most common referral sources. Providers qualified, however, that ED referrals were necessary and quite appropriate for some children and youth. As such, providers described the general factors needed for Mobile Crisis to divert ED use successfully for non-emergent children and youth. On the

other hand, factors that impeded successful Mobile Crisis use, ED diversion, and/or short-term Mobile Crisis use were also described. Included were family factors, issues with the referral process, and broader system issues such as the general inadequacy of the continuum of care resulting in inability to connect Mobile Crisis children and youth to services in a timely manner. Finally, the providers discussed factors that help or that are innovative in Mobile Crisis.

Categorized Qualitative Results.

Providers' description of the youth typically served, EMPS, and common referral sources.

Providers described the children and youth with whom they work as follows:

> *"[T]he kids that we work with are at risk for suicide, homicide, substance use, anxiety, depression, so you name it, whatever a crisis is, it's a crisis to us."*

> *"[While] there's a decent population of kids that we see, that truly have biological mental health disorders that are more psychiatric in nature … most of the kids we see are kids who've experienced trauma or environmental stressors…"*

All described EMPS similarly. One of the clearer and more concise descriptions was as follows:

> *"EMPS is a crisis intervention program for youth up to age eighteen. We do work with nineteen-year-olds when they're in school. So, we provide crisis intervention, de-escalation, [and] support with kids in crisis - that could be emotional and behavioral, psychiatric. And really, the point of the program is to go mobile out in the community to meet kids and … adolescents where they are experiencing that crisis. So that could be in schools, at homes, offices of other providers in the community, DCF, [or] probation. And we're accessed by contacting 211. And the unique piece about [EMPS], aside from the crisis intervention, is that we're … able to do a bit of follow-up as well. So, we can stay involved with kids and their families for up to forty-five days. And during that time, even outside of that initial assessment, and that initial de-escalation, we do follow-ups with the families and with any other providers who might be involved with the families with the goal being that we connect that child with the appropriate level of care, so that they're able to be maintained successfully in the community."*

Providers described three response types depending on the nature of the call.

> *"Mobile [is] the most common with us needing to respond within 45 minutes of the phone call … deferred mobile which can be potentially set up for outside of the 45-minute block, so those are responded to within 24 to 48 hours, and then non-mobile which is just over the phone support."*

Providers elaborated on each component of EMPS services in great detail, indicating a sound and consistent understanding of and fidelity to the model. Other than the characteristics of the model elaborated on below, this report mostly focuses on the factors that facilitate and impede the service rather than the service itself.

Providers noted that a factor that distinguishes EMPS' safety plans from those developed by other providers is the extent to which EMPS providers involve families. According to one of the providers:

> *"I think one of the things that we do really well is including the family. I think sometimes a lot of providers don't necessarily include the family. They don't put things in the family's words. They don't ask the family, "What is a successful outcome to you? What are you hoping to get out of this? What do things need to look like in order for you to know [you're successful]?" … we do a lot of that. You know, we don't come in as the experts and say, "Okay this is what's*

going to happen." We kind of empower [families] to come up with that themselves and I think that that helps ... our situations ... be successful… They feel like they can manage the situation in the future and if they can't, they know that they can always reach out to us. We like to have the family involved as much as possible because it's the most important thing."

"[W]e don't take control from the families or the caregivers or the kids. Every decision that's made is made as a group… even the decision to [go] to the ED is discussed with the parents and a lot of us recommend it."

Further, the EMPS providers work from a strengths-based approach.

"We … come from a strength-based focus, which is really important, so we're teaching them to recognize their strengths, to look at them. Sometimes they don't even see [their strengths]... and then to build upon [their strengths]."

By involving the children/youth and their families so fundamentally and using a strengths-based perspective, the children/youth and their families are imparted with skills that they can use in the future if and when another crisis occurs.

Providers noted that many of their calls come from schools. As such, the ebb and flow of the work follows the school year. According to one provider:

"If you map [school referrals] from September 'til June … it just gets busier and busier. … March is the peak…. We call it March madness…"

Another provider continued:

[In] April-May … there is an immensely higher volume of calls... [I]t's getting to the end of the year where kids are realizing they're either going to pass or they're not going to pass. … [T]here's a lot of … demands …, parents being upset about grades being completed, truancy, all of those other things…"

Within the school year, providers noted that referrals tend to spike on weekends because of deferred calls from hospitals early in the weekends and homework demands later in the weekend.

"We're busy on Saturday mornings, because we get deferred requests [from hospitals], so that creates a cluster of calls that come in even prior to our mobility, and Sunday nights can be busy because the stress of doing homework and going to school the next day."

The extended school holidays differ, however.

"[T]he full school vacation weeks are very slow, so we don't get many calls, at all. We won't get many for Thanksgiving or Christmas, or any other…"

Similarly, in the summer when school is out, providers noted "*we are slow as [a] period of time"* and that rather than schools, *"parents, family … and providers"* are the most frequent callers.

Situations for which ED referrals are necessary*.*

All providers noted, however, that ED referrals are necessary for some of the children/youth seen by EMPS, and that the proportion referred to the ED is as expected. Providers described situations when referrals to the ED are warranted, noting two interrelated sets of factors: 1) the nature of the child's/youth's problems, and 2) the extent to which the family can keep the child/youth safe. For the former, one provider noted that ED use can occur when the children/youth are:

"…so greatly disabled that they're unable to contract for safety on an outpatient basis. They don't have the internal resources at that moment. They need to … be somewhere with a level of support 24 hours a day to get them back to a place where they can be safe in a community. I think there are times where we try very hard to figure out a way to feel that we can develop a safety plan that makes sense for the child, for the family, that we think it's a safe situation [to keep the child in the home], but there [are] just times that that's not possible …"

"Those are the kids that really, truly need inpatient care. I'm not sure how else to describe that other than the fact that they are in such a place that they are unable to safety contract or unable to come up with a plan [to stay in the home]. We're unable to find a way to motivate them to do that. They really just need to be in a very safe environment for a period of time."

As noted, families also have a role in the decision about ED referral. EMPS providers also assess the extent to which the family can keep the child safe. For example, one provider described situations involving a suicidal or homicidal child/youth and the untenable amount of vigilance required to keep the child/youth safe as a reason for ED use and in-patient hospitalization.

"Our biggest concern would be safety. So, if [the children or youth are] suicidal or homicidal or engaging in self-injurious behaviors and they can't be maintained at home, as far as the parents feeling comfortable, you know we, we would say…"Would you be able to stay up all night and do fifteen-minute checks?", that kind of thing and a lot of time, the parents just can't commit to that level of safety. So, that's definitely one of the things that we would talk about going to the hospital for."

Similarly, another provider noted:

"... there have been times where I recommended that kids with behavioral issues go to the emergency department because the parents can't control them, [and] we can't de-escalate them."

Both the child's/youth's level of acuity and the extent of the family's ability to manage the situation are considered in deciding whether to send a child or youth in crisis to the ED, with safety being paramount.

EMPS providers acknowledged the extent to which many parents understand whether their children should go to the ED, particularly parents of children and youth with crisis histories. As one provider noted:

"[ED use is] based on the child's acuity… [A] lot of the kids that we work with are very high risk, or may be at risk for suicide … have attempted in the past or may be always in crisis. So usually you'll see those kids use the emergency department more because the parents are really good … indicators of when [the children or youth] really need [the ED] versus calling EMPS … Oh yeah, psychosis, homicidality…. You know a parent will say, "I was going to call you, but this was what was going on with Sally, and it was very concerning and I knew she needed to go to the hospital." So, parents are really good indicators…"

Experienced parents often know when ED use is needed and may not even call EMPS in such circumstances even if they call EMPS in less acute situations.

Providers also noted that because EMPS cannot medically clear, the ED is used for those situations that require a medical evaluation such as self-inflicted injury, substance abuse, and/or the ingestion of pills. Providers described such situations.

"… If we receive a call for someone who's ingested something or has cut themselves to the point where they're severely bleeding, we always ask that they are medically cleared before [EMPS sees them]. We'll still assess, but of course, safety is our number one priority."

"[Another] piece of that is substance abuse. So, if we get a call because a parent or school assumes that a child is under the influence of something, …we'd still do the intake and get the answers to the questions, but then we may recommend going to either their pediatrician or to the emergency room to be medically cleared…because we're not sure what …they've taken…"

"If we get a call from 211 that says, "Oh XXX took 10 pills this morning and they're wanting you to come out and evaluate her at school." I mean, we will say "Send her to the hospital." We can't evaluate medically … and that [call] really shouldn't come to us anyway. I mean, 211 should be … saying "you really need to call 911", you know, because we can't clear them medically."

All three of these situations warranted ED use. The latter also indicates that some of these calls should not even go to EMPS which is discussed further later.

One interesting observation was about the timing of ED referrals by EMPS. A provider noted:

"*I think most times, if we're going to send their kids to the emergency room, it's going to be the first time that we see them, if it happens."*

Facilitating and impeding factors for EMPS to successfully divert ED use for non-emergent children and youth.

The facilitating child/youth, system, and family factors needed for EMPS to divert ED use are relatively simple to articulate. The child's/youth's crisis state can be deescalated by EMPS services. The system factors needed to support and refer the child and family are available and accessible. Providers described facilitating family/caretaker/parent characteristics as follows:

"Parents who are willing to be supportive of the child, who don't have limitations themselves … and who are willing to be open to mental health with all the treatment and making changes [the] same as the child ... [and] … who have resources, who have access [to] … healthcare, who have transportation, who have all of these other things that make it a little bit easier to access support [are more likely to be successful] …"

Support is also critical. As stated by one provider:

"We always go back to … how connected families are - what kind of natural supports, informal supports they have in place… [F]amilies who have been here … forever and ever and have lots of family supports or friends in the area, or religious groups that … they fall back on for support - those folks tend to be very successful in accessing what we recommend.

Familial-related factors that impede EMPS services.

The reality, however, is rarely so facilitating. Providers noted an extensive list of factors that can impede EMPS use. These are categorized into three types - familial, referral, and system factors. The factors/impediments and what the providers do to address them are presented below.

In contrast to families with support, the same provider discussed families with relatively little support.

> "[W]e work with families who have just moved here from… across the country or from a different country and are feeling pretty isolated and don't have a good understanding of what's available to them. We get much more heavily involved in … supporting them to get connected and understand what's … available to them."

Just as the families need support, so do the children/youth. Lack of family support for the child/youth makes the work that much more difficult.

> "[S]ome of our kids will not have that family support, so when we ask them who's a support in your system, they can't identify one… [W]e see that those are the kids that usually struggle more than others."

The absence of familial support and/or the presence of family stress in general may be exacerbated by poverty:

> *"[P]overty … may add to the family stress that … just make[s] it more difficult."*

> *"[T]he socioeconomic factor is a big thing … sometimes we do have parents who are interested and they're invested in their children, but sometimes … they're single moms and they're working and it's difficult for them to … carve out the time … to attend an appointment …"*

More specifically, families of limited means may not have phones or, they may have very limited cell phone plans. This severely impedes communication. As one provider noted:

> *"[Some] families don't have phones, or [their phones] run out of minutes, and then we have no means of contacting them. And because we are voluntary, we can't just show up at their house and, "Surprise, I'm here." So that's definitely a barrier that we have to work around … There's always letter writing and … with releases … [EMPS could be] talking to the school and having the school talk to mom. … [W]e're going to keep trying. We're not going to let [the absence of a phone] deter us. But it does make it difficult."*

Rurality (and, relatedly, access to transportation), speaking a language other than English, and culture are also impediments to EMPS.

> *"[C]onducting an assessment with language line is not best-case scenario. And then to try and identify a provider has been really tough."*

Independent of language, culture can also impede.

> *"There are some cultures that are a little bit hesitant to engage in mental health services and they might not necessarily have been the one to call through 211. It may have been the school and so we're responding and they're involved, but just culturally they're not interested. They want to go through different avenues or they want to do other types of things and we have to respect that and work with that."*

Parental circumstances such as divorce may impede.

> *"…[S]ome of the other toughest cases I think we've had to work with were contentious, divorced parents … [O]ne wants their child to get support and help and one does not and now it becomes a legal mess. … That is definitely a factor and something that interferes with our ability to be helpful."*

Parents found to be abusive and/or neglectful or where there is domestic violence are also very challenging.

> *"We see, not a large, but a decent amount of scenarios where there is child abuse and neglect … when that is present, it's harder to get that child's needs met and have them engage,*

especially around domestic violence, exposure to domestic violence, because there's a lot of secrets about that, and danger."

Further, some parents lack an understanding of mental health treatment.

"Some parents just don't see the benefit of it, don't think that it's needed or don't believe in it, really. So, that sometimes can be a barrier in getting parents to see that this isn't a behavioral issue, per se, if that's what's going on for the child, and [is] more of an internal mental health issue that's occurring. So …"

Consequently, EMPS providers:

"[j]ust continue to talk to the parents and kind of educate them about the differences and what goes on internally and relating it to a medical issue …"

Interestingly, this same provider noted that it:

"tends to be the males or the fathers who have a harder time grasping the mental health issue versus having something physical that they can put their hands around to fix with their child."

Other impediments include bad experiences with mental health providers.

"So, if it's a good experience, then [the families are] more open and trusting what you're kind of recommending. If it's a bad experience, then they're like "No." They're really stress[ed] and very resistant to what you have to say, so it's gonna take a longer time to kind of get them to open up to what you're recommending."

Further, some families are at their wits' end and have no patience for the process.

"I've encountered a lot of families who are kind of like at their end … they want an immediate fix, and sometimes they don't understand that referrals take time, or we can't remove a kid from the house."
"And there seems to be a lot of turnover for child psychiatrists in the northeast and families get frustrated. I think that's something that we're coming up against. Sometimes it's something that's not related to EMPS whatsoever, but we're part of the mental health field and the families really tire of the mental health field. So [we] really try… to meet them where they're at and acknowledge those difficulties."

There are some parents who want their child to go to the ED even if the EMPS providers concluded that the ED was not necessary. According to one provider:

"… there are times we go out and do assessments. We can safety plan, but ultimately it ends up that the parents [say] …"I still want to take her to the ED." [I say] … "As a parent, that's your right." I can't say, "But I am telling you that you can keep your child safe and she could be safe in your home." Then, they go to the ED [to] be evaluated and then sent back to us. [The parents] need that reassurance and that's fine."

Another provider concurred.

"[T]here are just some families that will want their child to go inpatient, or just want their child to go. So, using our service is not their first choice, 'cause we're gonna try to work a plan around them being able to stay home."

This same provider, however, noted that some families that initially prefer the ED may opt subsequently for EMPS, particularly when their ED experiences do not proceed according to the families' plan.

"[P]arents report that using the emergency room can be expensive. It can take a long time. They're frustrated because their child's just sent home… I think they … have an expectation that their child should go inpatient… [S]o for families that really had some difficult experience using the emergency room, [EMPS becomes] more desirable."

Another provider concurred.

"With no follow-up, so if a family has that repeatedly, they're probably less likely to go to that hospital for care."

Such families may shift their preference for care from the ED to EMPS. In such a scenario, the family may then seek EMPS' services and are welcome. Interestingly, this scenario is not completely consistent with the C&RT findings –which suggest that those with prior BHED services have a greater likelihood of returning to the BHED services after receiving EMPS services. These qualitative findings suggest that there may be diverse subgroups of prior BHED consumers – including some whose comfort level with ED's diminishes through repeat interactions. Further research may be needed to sort this process out and potentially determine factors that create aversion to ED services in different families.

"[E]ven if a family initially declines or they don't go through with [our] recommendations, they can always call again. We actually encourage that so we're never turning any child away."

Lastly, providers noted that families with a history of parental mental health problems are more likely to be chronic EMPS users.

"[W]e were recently … looking at of the most frequent use families, families who have called multiple times and one of the themes it seems that crossed for both … us and the other EMPS providers is … chronic parent mental health issues. … [T]hat seems to be one of the biggest issues in terms of their need to repeatedly use the service and maybe not be able to utilize or retain the skills that were helpful to kind of calm the crisis."

This same provider also noted that the absence of resources may also contribute to the chronic need as follows.

"[F]amilies where there's a chronic level of impoverishment, ongoing mental health for multiple members of families, substance abuse and things like that … [are]… compromised by those other factors… I would say that [for them,] the intervention isn't as successful … the intervention will potentially need to be repeated multiple times … I think it just may be … more of a chronic issue."

For such families, the EMPS providers noted that they will probably have to repeat their services as such families tend to be chronic users of EMPS services This observation, we note, relates to the findings in the C&RT analyses regarding the associations between ED visits and Ohio ratings family functioning. Enhancement of services targeting families may potentially result in reduced subsequent BHED use among EMPS youth. The specific nature of the services needed may, however, require further research on the types of problems which most frequently lead to poorer ratings.

Referral-related factors that impede EMPS services.

Another set of obstacles to EMPS use is failure to use and/or the inappropriate use of its referral system. As noted, EMPS is a voluntary service that gets most of its referrals from 211. In order for this referral process to work well, those who are likely to make referrals to EMPS need to know how to access EMPS, understand that the service is voluntary and so the need for parental consent, and

be able to distinguish between those circumstances that are appropriate for EMPS versus the ED. However, providers noted that a lack of knowledge about 211 and a propensity to call 911 for help in a crisis continues, even when EMPS would be appropriate. According to one provider:

> *"[W]e have a lot of folks in the community who immediately dial 911. They immediately send the child to an emergency room, to start with. … So, we don't really have the ability anymore to do any type of diversion because the child's already there … 911 is really in their brains."*

Providers discussed their effort to educate police and other first responders about the 211 referral process. Interestingly, this may tie into the finding that "Region" was a predictor of ED service use among EMPS youth in the C&RT analyses. It may be that familiarity with the 211 process may vary by region and that certain regions may need to be targeted with more information and outreach so that they become more familiar and comfortable with the EMPS referral process.

> *"Educating police officers [in] using crisis [services] helps reduce the chance that an officer would send a child to the hospital, because they know the services available. So, educating … first responders about the service, I think has helped."*

While some were positive, others noted disparate results. Providers also acknowledged that some police situations are more amenable to EMPS than others.

> *"[S]ometimes [police] don't have time to call 211 and we don't … get parent permission to have us come out. Sometimes it's just not an easy process for a police officer to use us instead of writing a paper and sending a file."*

Another cause of the preference for dialing 911 rather than 211 is dated agency policies and procedures manuals that still instruct employees to " dial 911 in the event of a crisis or emergency." One of the providers elaborated.

> *"[S]ome of the schools have that in their district policies, where, you know, they have school handbooks for their faculty or their staff, teachers, that literally says that if a child's having a behavioral health crisis, you dial 911 and so, they aren't instructed to dial 211. They're instructed to dial 911."*

One provider gave an example from a recent meeting.

> "*Our Executive Director was sitting at a school readiness council meeting the other day … [T]here's about [X] schools in the City … and they are in the midst of beginning to look at their suicide policy and how to respond to suicidal children. And right in the policy, it still says, "Dial 911."… so [the Executive Director] pointed [that] out, of course … "this policy needs to be updated." Like, why aren't you dialing 211 and asking for mobile crisis?"*

These problems with schools are in spite of that fact that EMPS has memoranda of understanding with them.

Then there are those circumstances wherein referring agencies do use 211 to access EMPS, but may not fully understand EMPS' voluntary nature, meaning that parents/caretakers can refuse EMPS service. One provider explained.

> *"Sometimes you get school referrals … and the parents don't know about [the referral} … So, then we'll have to call the parent, and [the parents are] like "No, I don't want you to see my kid at school." … The thing is, if [parents] say no, then [EMPS] can't go out."*

Similarly, referrals from some of the hospitals and intensive out-patient programs do not always include parental consent. A provider clarified.

"[W]e get a lot of referrals from [a hospital or intensive out-patient program], and sometimes the families aren't always on board with [EMPS]. And we need parent consent to go see the kids, so without that, we can't go see them… [T[he hospital will sometimes schedule without talking to the parents, or they'll call us without talking to the parents, so then when we call the parents … [and] they're like, "No, we don't want you." It doesn't happen all the time, but it does happen."

In some situations, the failure to inform parents may be part of a broader issue. One provider elaborated, noting a long-standing problem seemingly fueled by the schools' frustration with lack of parental involvement. One provider explained,

"There's this phenomena that's been going on for many years, where schools sort of insist on involving [EMPS] in an attempt to not involve parents at times, because [of]… the parents' lack of engagement, and their concern is that [these children] won't get services, and yet it completely … circumvents our relationship with families, and the work that we're able to do."

Further, some schools may use EMPS to press their own agenda, compromising how EMPS functions, and creating rules that EMPS is unable to enforce given its voluntary nature. As one provider summarized:

"[T]he schools sometimes force the family to do our services, which kind of puts us in a negative place as far as engagement. I'm pretty sure all of us are usually able to … make the family feel more comfortable so that they're more willing to have us, but that would be a challenge initially. … [T]he family's like "I don't even really want you guys here, but the school said I have to." … [W]e don't really want to go in on that note because we are voluntary…. I guess just educating the school staff as well, letting them know that we are voluntary. [We want to say,] "Please don't force or make up these rules that kids can't come back to school until they're assessed" [by EMPS]."

EMPS providers engage in psychoeducation and community outreach to address this problem. Providers noted some success with this outreach. According to one provider:

"I've experienced more and more schools making that attempt to contact families before they … call us, which is great. It's very helpful for us."

Another problem related to referrals is the referrer's inability to distinguish between those situations that warrant EMPS versus the ED. Accordingly, EMPS also provides psychoeducation to parents and schools on this topic.

"[O]ne thing that usually helps is … explain[ing] when to call 211 and when to call 911… [S]ometimes I'll go out to a school or I'll speak to the parents and I'll say, "if your [child] is making a comment about being suicidal or if your child['s] … behavior is out of control and you feel like you're at the point where you can't handle it, call 211. However, if your child is in legitimate danger - jumping out of a car, saying something [and] … they have a weapon in their hand - do not call us, call 911." So that differentiation has really helped in terms of them calling [EMPS] and [EMPS] being able to safety plan with them versus the school or the parent automatically going to the ED because the child says that he's suicidal. So we've been able to stop a lot of the kids that are going to go to the ED just because of that kind of safety assessment intervention that is taking place."

However, in spite of this educational effort, some schools' prefer to refer the child/youth to the ED in spite of EMPS' ability to handle a given situation. A provider clarified.

"[S]chools may very well call us because they want us to send the kid to the ED instead of them and we have to say, "We were able to safety plan with them, so that's not our appropriate recommendation. If you want to make that call, you're the one that has to do it."

Similarly, another provider described a situation wherein:

"… EMPS came out and evaluated. We deem that [the children/youth] were safe to return to school." [The school said] "Well, no actually we want a psychiatrist to evaluate them, so we're going to send them to the hospital anyway."

In addition, schools sometimes send students to the ED rather than EMPS even when they have called EMPS in the past, which is perplexing to EMPS providers. As one provider noted:

"… [T]he thing that's so frustrating to me is that the high utilizers of the ED [and the 911 system] - schools especially - are [also] high utilizers of 211. We go there every day."

As such, it would be helpful to know how schools decide when they call EMPS and when they send students to the ED.

Similarly, the EMPS providers noted that there are private practitioners who may be risk averse and/or concerned about liability and so send their clients who are in crisis to the ED rather than addressing the crisis themselves and/or calling EMPS. Two providers reflected:

"… I think in general people who have a private practice or [who are an] outpatient provider, as soon as they hear a kid say they're suicidal, they jump the gun …. They say, "You need to go to the hospital. I'm calling 911" when in reality, that could all have been addressed through a simple safety assessment or calling 211…"

"… some folks [say], "I'm concerned about this kid. If I send him to the emergency room, I've done my job because they'll determine if [s/he is] safe or not and I don't feel liable anymore. Now, it's somebody else's clinical decision."

Further, even when EMPS is called and does assess, some practitioners still prefer the ED. According to one provider:

"I've gone out to private practices and they say, "Thank you for doing the assessment, but I feel liable if something happens, so I want them to go to the ED. Otherwise they can't come back to my practice for services."

Again, these findings dovetail with the C&RT findings that those EMPS youth who have recent prior intensive service experience (including BHED and or inpatient treatment) are more likely to subsequently experience ED visits. Providers may perceive hospital-based ED services as a "safer" option for youth with continuing and persistent behavioral treatment issues.

On the other hand, some providers noted that some parents, private practitioners and schools seemed more likely to refer to EMPS than the ED, purportedly because of EMPS' community outreach work. Two providers concurred.

"I think with our outreaches, we are minimizing kids going to the ED, because more parents are becoming aware."

"Since we've been doing a lot of outreach to schools and community providers, I think people know more about us now. So, we're successful in that [they are] calling [EMPS] first, rather than going to the hospital for the psych treatment."

Furthermore, some providers suggested that there may be a growing reliance on EMPS to do the crisis work that a private practitioner might have done in the past. Providers also noted that when EMPS is called and the crisis addressed, there is a very natural propensity for the client to establish an alliance with the EMPS provider. This may inadvertently adversely impact the working relationship between the client and the referring practitioner.

> "*I think in some capacities our general providers, especially … our outpatient providers, have stopped doing crisis work themselves … and will call 211 instead or tell the family to call 211 instead and I think that that's just an unintended [consequence]."*

> *"I think the more that there are other folks [like EMPS] who are available to do the crisis work, the less some folks are… doing it themselves … [The] therapeutic relationship can develop out of these kind of circumstances and how valuable therapy can be when somebody else is able to be a part of that [crisis] process. There have been times when [families] will come and these guys are working with them and they do crisis work and the kid says, "Well, can I just continue to see [the EMPS provider]? You were so helpful." And so then … my other therapist is even less valuable. … I think [this referring out in a crisis] can kind of hinder the [original] relationship in some ways."*

One last set of problematic referrals that the EMPS practitioners described were from the ED providers themselves. One provider noted:

> *"I feel that [the EDs] discharge too early, and they put the liability [and] … responsibility on [EMPS], where we feel that that individual should be in an inpatient setting."*

The children/youth and their families are told that the reason the child/youth was discharged from the ED and referred back to EMPS is:

> *"because there are no beds. So then [the children/youth are] … our responsibility, so that seems very dangerous and you know … you don't just discharge a kid because there's no bed … But that's what families are being told and that's concerning for us."*

Such a discharge affects the family.

> *"It … goes back to how the parents perceives that crisis, right? So if the hospital's letting them go, then their [condition] must not be that serious. So the next time it happens, [the family may say] "Oh, they're just doing this for attention" … where we [EMPS] understand that maybe it's something a little bit more. So it makes our job … more challenging because now we have to do some more psychoeducation in a way where the family will engage and understand … and it takes a couple tries sometimes."*

The providers concluded that whether or not a child/youth is hospitalized is inconsistent.

> *" [I]t always depends on what hospital, what day, who's working -- there's no internal system. I feel like [the EDs] are just … not reliable."*

The EMPS providers understand that the EDs are over taxed, just as EMPS is over taxed. The EMPS providers noted that there is a reciprocal relationship between EMPS and the EDs for which extensive communication is needed on an ongoing basis. As one provider noted:

> "*The ED utilizes us just as much as we utilize them, if not more so. We are their discharge plan. If they get a kid in the ED that they deem is not appropriate for whatever reason, they're calling us to follow-up with the family. We just got a call today from a kid who's getting discharged from an inpatient unit … even though that is a completely inappropriate referral because … you can't go from 24-hour therapy and monitoring to EMPS. That's not how levels of care work … especially during the busy season, because even with the ED, they*

don't have access to certain services. They will discharge because they need the bed, but the intake IOP and PHP is not for another two weeks. Then, we have to go and monitor the kid."

As this provider noted, not all of the referrals from the ED to EMPS are appropriate, which is related to the inadequacy of the continuum of care, discussed in the next section.

Appropriate referrals may depend on positive working relationships between the EMPS site and local hospital EDs. While most EMPS sites we spoke described successful, positive working relationships with local hospital EDs there were some exceptions. One practitioner described the team's relationships with local hospital EDs as follows:

"We have # major hospitals here … and they couldn't be further apart or different from one another, as it relates to mobile crisis. We have one hospital … [that] believes they can do everything themselves. So, they take care of whoever presents to their emergency room with behavioral health issues and they don't consult us at all or often don't consult a provider that's involved whether it be mobile crisis or a regular therapist that the child has been seeing. And then we have [another hospital] which is the exact opposite. We actually have a collaborative memorandum … in place with them, that every child that appears there in their emergency room, they ask us to go over and assist. So, we get the opportunity as a mobile crisis department to assist with that child and family, where [as] at [the other hospital] we don't get that opportunity. So, it's really quite different."

Broader system-related factors that impede EMPS services – the inadequacy of the continuum of care.

Another set of problems that constrains the effectiveness of EMPS involves the inadequacy of the continuum of care. Providers reported that increasingly limited resources due to program closures and the time-limited nature of the programs that do exist (particularly for certain diagnoses such as autism) have resulted in a set of children and youth who are unusually challenging for EMPS to connect to resources. In addition, and as was already mentioned, there is a perceived shortage of psychiatrists in some areas. Further, those covered by private insurance face additional placement challenges (due to potential or perceived reimbursement obstacles) . The difficulty connecting some youths to services is often manifested in longer length of stays (LOS) and/or more frequent reopening of EMPS cases.

Estimates of average LOS varied to some extent by provider. Whereas one provider estimated the following:

"… a short [LOS] would probably be two visits or maybe less than five days open. Average is probably a week or two, maybe. Then, the long is the 45 days."

Another's estimate for average LOS was greater.

"I would say the average is thirty to forty days."

All concurred that the LOS outliers (long LOS) are for those children and youth for whom there are no or very limited services. As one provider explained:

"Children that used to be in group homes or residential facilities are in the community now, not because that's what they're ready for, but because those places were closed. [For] …

children that are on the spectrum of autism …there's very few services available to those kids, so, they don't have anything."

Another provider agreed.

"I think for us, in general, the outliers are the cases that we cannot connect to services. I don't think it's necessarily their mental status being unstable or being risky, it's really just that we are not able to [connect to services], like it's been kids with autism, for example…"

For those on the autism spectrum, the need for a current, test- derived diagnosis (as required by insurance carriers) was also noted as an impediment to service provision.

"[C]onnecting kids to ABA [applied behavioral analysis] services can be tricky at times … they need the diagnosis [and] … they have to have the diagnosis through testing … and it has to be within the past year, so they have to get recertified every year, essentially… If you have HUSKY then you have to go through Beacon, and if they don't, then you have to find someone with ABA that takes your insurance. It's very difficult."

Even when these children and youth are able to be served by the few programs that exist, services are generally time limited. In such cases, EMPS acts as a bridge between programs. One provider explained.

"Let's say a child might have a condition. Let's say with the autism spectrum that requires just ongoing care and you know, they might need intensive services for a very long period of time. But that program has to disengage at some point, per their model, or per whatever requirement they have. So, when that ends, the client still has a need. But who provides it? Is there someone that can step in immediately? And that's a very tricky part too ... We refer them to … a [program] that will be able to take them immediately … Most don't. So you know, one thing that we'll do is … be the bridge from the point of crisis to the intake at the next program."

In addition to the children and youth with spectrum disorders, there is another set of children and youth who are particularly difficult to place in treatment because of wait-lists and time-limited programs.

"we can't connect families because there's long wait list."

"I think we're seeing more and more complex and acute cases, both acute and chronic system violence. We'll have multiple episodes with them and what happens is they'll have a service provider that stays in place for three to six months and it's a very intensive provider. But then when that ends, as most intensive programs do, then they'll pop up back in EMPS and we have to think creatively about whether we should refer back to that provider or think about another program or service that might be needed. And that's difficult sometimes."

Providers noted that private insurance can make it more difficult to access services than public insurance. Two providers explained.

"I … think besides the long waitlist, one of our biggest obstacles is our commercial insurance children. There is absolutely no way, really for them to go, especially if they need some sort of in-home, especially if the child has Autism. We are very challenged and we feel like those families… are in crisis, because we're like it's hard to go to a family and be like, "I'm sorry. There are no services." If you have AETNA insurance and your child has Autism, I'm sorry. There's really nowhere for you to go."

"… we have a lot of kids that are very acute and high risk, and would benefit from an in-home service but depending upon their insurance, they may not be eligible for it."

In such cases, EMPS providers are creative and do what they can while keeping safety in mind, but first have to establish the connections. As one provider explained, the sequence as follows.

> "*It's all about building relationships. Once you have a relationship with someone and they realize the extent to which we can help, usually they call 2-1-1 or maybe even a direct call. For instance, like an out-patient therapist will say "Listen I'm going to be on vacation for the next two weeks. Sally, or whoever, is having a really hard time. Is there any way that you could see? And then when I get back if we have an overlap of a week just to see … I don't want her to go back to PHP (partial hospitalization program)…"*

This knowledge of community resources facilitates referrals. The same provider described such a scenario.

> *"[B]ecause we've become so involved within our community, we know a lot of our particularly private providers pretty well. So it's really nice to be able to say, okay, I have this 15-year-old girl who's going through x, y, and z. I know that there's this out-patient therapist who does exceptionally well with this type of child. So it's really nice to be able to make those referrals where it's more catered to both the child and the clinician and you can make those really good matches. I think that that's been helpful … We may not have a lot of psychiatrists, but we have a lot of really, really great outpatient therapists …"*

When insurance is limiting, this same provider continued.

> *"[We] … [look] at their insurance and what they have and what's going to be covered and [see] if we can maybe put multiple services in place to kind of augment what would have been that five days a week PHP [partial hospitalization program], right? So maybe if we can get them into intensive outpatient and supplement that with a group, keeping EMPS involved until they're a little more stabilized - so being pretty creative with some of our plans. Things like transportation gets really tough …. There's not a lot of public transportation and there's also not a ton of psychiatric providers."*

In some cases, though, needed services cannot be adequately jury-rigged from available services. In such a case, EMPS bridges and collaborates as needed until the needed services are available. The provider concluded with another example.

> *"[EMPS providers do] hefty safety planning. We bridge treatment for as long as we can and we try to figure out a way that, again, … builds on our community relationships…[M]aybe we can call one of our out-patient providers and say "Can you continue to see this client maybe twice a week until we can get this in-home service to begin?" There's really only one program for children under six years old, and that wait list is always at least four to six months. So it's definitely difficult."*

A thorough knowledge of resources, facilitated by extensive community involvement, is needed. These demands along with perceptions of unreasonably high expectations for EMPS services led some providers to convey a sense that they were overwhelmed.

> *"I feel at times that we are looked upon as a program that will take anything and everyone and be the end all to be all, which unfortunately we cannot be. So, sometimes that gets heavy, feeling like we have to always do it all and always be the on call for everyone else in the state. …"*

The creative bridging interventions that EMPS implements do not meet the needs of some children. In some circumstances, there can be negative consequences as a result of the inability to connect to needed services and the long wait list. One provider explained.

"I've had those kids that stayed open longer than the 45 days … not being able to connect to the services, [and on] long wait lists … I feel like those kids sometimes deteriorate because … they're not getting that consistent treatment that they do need. Sometimes I do find myself, because the kid is deteriorating, having to send them to the hospital and they do either get admitted and/or stay over for 72-hour observation."

Further, with longer-term EMPS cases and/or multiple re-openings, there is an increased probability of a connection between the EMPS provider and the children/youth/family. According to one provider, the children and youth will ask if they can shift from their current provider to EMPS, as noted earlier.

"The structure of the EMPS, we're a short-term program. … [However,] there [are] a lot of families … that … really like the clinician and they'll be like, "I just want you to be my therapist." So, in those situations, they'll be holding on to you and you're like, trying to let them go and they're like, "No." So, then in those situations … we have to be really mindful to really try to get them to the next person, so that they can do longer term care.

Nevertheless, it is noted in the C&RT analyses that longer lengths of stay were associated with a reduced probability of BHED use among ED youth. This suggests that more sustained efforts on the part of EMPS providers may be beneficial for most youth. What remains to be further explored is the optimal length of time for a service episode and how length may vary by youth and family characteristics.

Sometimes, no matter how connected and creative EMPS is, there are just not the resources needed. One provider relayed a case example of a Spanish-speaking mother whose child had autism.

"[T]hey were from [out of state] …and you know, they were, so … completely homeless. The child had some very serious autism spectrum disorder and … [they] had nothing but mobile crisis. I didn't know how …you support a case like that.

"[E]ventually the state did get involved and she received support from DSS, but it was still very complicated because then, you know, she had a sheet of paper like this with about ten contacts that were a mix of case managers and in-home providers, doctors, [and] psychiatrists … How do we help the mom coordinate all of that? And who's responsible for each part of this? …we kept extending the forty-five day treatment plan … because it was just that difficult with [a] socio-Spanish speaking family and autistic kid… [S]o that took a very long time, and it wasn't because [the child] … was really a safety concern … It was just truly that we could not just make that connection, and we didn't just close the case without him being connected."

Helpful and/or innovative EMPS practices.

The providers also discussed helpful and/or innovative EMPS practices.

Helpful practices.

In general, communication and collaboration within and outside of the EMPS agencies with other providers and services such as schools and police who also interface with the children and youth are critical.

Providers noted it would be or is helpful to consult with an agency and/or ED psychiatrist when a second opinion is needed. The need is described in the first quote below. Agencies that do have a psychiatrist on staff find this sort of consultation helpful, as indicated by the second quote below.

> "*It's hard for EMPS because we don't have anybody to go to for a second opinion. If we go out and see a kid and we're not sure if we're getting that feeling in our gut, that… "I don't know if I can hold this kid in the community", the only other place to send them is the ED. We don't have anybody else to say, "Hey listen." See, everybody else in the community and the State has EMPS to say, "Hmm, not sure. Can you guys come and take a look?" We don't have anybody else besides the ED, so I think sometimes it may look like we're over-utilizing the ED because we are sending a lot of kids that maybe don't get admitted, but sometimes we need somebody else to take a look at this kid and say, "Hey, [are these] inpatient symptoms, behaviors? Do we need to [send to the ED/]? What's… going on?" We don't really have anybody to bounce things off of."*

> *"We have psychiatric services also available through our program, so if we do have a child that requires, you know, to see a psychiatrist, then we have availability and we can… safety-plan with the child… [W]e are able to offer it through our program, instead of having to send the child to the hospital."*

Along these lines, some of the EMPS agencies have high-risk management team meetings, an in-house mechanism for addressing high-risks as well as chronic, frequently repeating ("frequent flyer") cases. One provider described the meetings as follows.

> *"We have a [weekly] high-risk management meeting that is there to … address high-risk cases, and maybe also cases that have been returning multiple times and are just on a different level.. . [W]e're able to bring those cases to the meeting … the clinician whose case it is … the medical director, and all the directors [are there] and everybody kind of brainstorms and they come up with a plan."*

EMPS agencies also have a facility liaison who is an EMPS clinician who takes on some of those more persistent or challenging cases. According to the providers, this position was created about 1-2 years ago, apparently in response to the presence of more challenging cases served by EMPS, many of whom have long wait times for the needed services if in fact such services are available and accessible. The providers also explained that each program has input into how to best utilize the liaison position at their respective agencies. The providers agree that having this position is an improvement, but does not address the needs of some of the most challenging, complex, high-risk cases. According to one provider:

> *"I think that there are certain children, depending on the service they're waiting for, [that] EMPS involvement could absolutely stabilize them. But oftentimes we may have really high-risk [children and youth] who need that really intensive level of care. And then imagine having to wait five weeks for that. Things happen during that time. …It can kind of go either way, depending on what the issue at hand is. We do have a position within EMPS, the facility liaison, who works with those higher risk cases, so that they're more available for visits. So that's one way to try to mitigate those potential ED visits that may pop up in between. So I think that [the facility liaison] has been helpful, but, again, I think it's very dependent …"*

Outside of EMPS, but within the broader agency, EMPS providers can collaborate with staff from other agency programs to inform practice. One provider described this practice.

> "*We do collaborate with other programs within the agency, which is awesome… [W]e're like, "We just saw your client, they're gonna come see you tomorrow…Here's what happened and here are my recommendations." And they're very forthcoming. I mean they take it, whatever*

it is, you know. If we say they need a higher level of care, they're like, "great", they're pretty good."

More broadly, close coordination and collaboration between the EMPS programs, the ED providers, and other child and youth mental health service providers is also critical. Providers can brainstorm and share information. Examples of the need for collaboration between EMPS and the EDs are as follows.

> *"EDs will call us and say, "Hey listen. This school just sent us … three kids this week. Can you reach out to them and talk to them and kind of remind them that you're there and that they don't have to just send to the ED?" So, [the EDs] are also reaching out and kind of pinpointing the frequent flyer kids and where they're coming from to have us … be that liaison to kind of get in the middle."*

> *"[The EDs say] "Why the heck did this kid come to us when this was a perfect 211 case?" and we're like," we know." … myself and my supervisor have quarterly meetings with [one of the hospitals] to discuss their frequent fliers, so schools that they get a lot of kids from [are]within our catchment area… we have a lot of conversations about who is really over utilizing the ED and how do we as the EMPS program tap into those people."*

EMPS providers also noted that collaboration with DCF are also very helpful. DCF is perceived as a font of information.

> *"it's very helpful that we have a very good relationship with DCF in our county too. So, we can always call them. We've known them, I've known them for many years and just say, "*Hey what do you have for this or anything for this or what would you suggest for this?"

> *"[DCF] will often participate in team meetings and consults, both with us and then go back to the front-line worker who's worked with the family and just try to help explain the clinical nuances and so that they're both, we're lucky to have folks who have been there for a long time again. Relationships are there. People are connected. They know each other."*

Participation on local boards and committees and meetings where the whole town is talking about mental health are natural mechanisms for increasing the awareness of EMPS. Finally, providers also discussed the community collaboratives. As described by one provider:

> *"…statewide there are … community collaboratives where there are supposed to be family and providers coming together to talk about gaps in services for mental health treatment…. there's not many family members who come to many of the collaboratives that I go to, but that's always been the basis of it - … these family members who have mental health issues for their children [who] are coming to these tables and saying these are my experiences."*

Innovative practices.

Providers also talked about innovative ideas, some of which were initiated by discussions with clients. For example, one provider suggested that it is not uncommon for clients to suggest that EMPS cases be given priority access to clinical services.

> *"A lot of times [clients] will call us and say, "Well, can't you expedite this referral?" or "don't your kids get to the top of the line?" … You would think a crisis program would have some kind of pull when it comes to certain services, but we don't. We have no pull whatsoever, not when we send kids to the ED, not when we send kids to other services. It is just like any other referral and that's really also a systems issue. You should have spots open for crisis programs that need to make a referral fast."*

Another innovative practice developed at one agency addresses basic, non-clinical needs of families in crisis, explaining this practice as follows.

> *"Sometimes I think that families go into crisis because maybe they don't have any food and that's stressful to the family or they are going to be losing their house and the kid is feeling that and acting out. So our case managers are helping to link families to those kind of services, so helping them to get food, to get housing, to get basic needs: furniture, clothes, after-school activities, you know, stuff like that. And that's something that we have kind of recently expanded on and not a lot of other EMPS programs have case managers to be able to do that."*

Some programs are implementing a preventive approach as part of care-coordination or the child and family meetings. One provider explained.

> *"This is a newer trend for us… [It's] not necessarily full EMPS involvement. We're not going out and doing an assessment and opening a case… it's more preventative [and with]… care coordination [and the] child and family team meetings. [They say] "hey, here's the service. Let's have them come out and talk to you, kind of familiarize you with it so that when you do have a crisis you feel comfortable calling." So we've done that with a number of families now, just to kind of get on the front end of that."*

There were also innovative suggestions about how to schools could more effectively handle parental consent for EMPS involvement with children needing the service.

> *"[T]here's a lot of work to be done, I believe, in relation to policies within Connecticut schools, around the EMPS Team. Currently, we have the MOUs that nearly every school district has signed to use the service, but I have never heard [of schools] having a policy written in their student handbooks for parents around crisis services… when we… try to educate [schools] about the importance of parents being contacted, and even being involved in the assessment, there's a reluctance - I don't want to say a resistance - I'll say a reluctance to involve them at times, which I think is a pretty big concern. There's gotta be a way to either change the perception from schools, or the relationship with parents … it's similar to … like a medical emergency, that if their child needs a crisis eval, that [schools] have documentation, an agreement with parents about how that would occur, because unfortunately, we're between those two parties at times, and it creates conflict for everyone, really. So, that's a barrier."*

In other words, just as schools have documentation that families sign that allows schools to "treat" in the event of a medical emergency, so might schools have documents that parents would sign that would allow EMPS to intervene in the event of a behavioral health crisis.

Section V: Conclusions and Suggestions for Further Research

Conclusions

- The use of ED services to treat mental health problems in youth is skyrocketing due to both micro and macro-system causes
- A limited number of state and local settings have implemented the type of service model analyzed for this report, the Mobile Crisis
- There is a lack of systematic data evaluating the impact of Mobile Crisis involvement on ED use
- Quintile based propensity analysis predicting any post-episode ED visit indicated that Mobile Crisis youth – compared to a group of matched youth receiving ED services- have a reduction in risk for any subsequent ED visit in an 18 month follow-up period; the reduction ranged from 16% to 34% (with a point estimate of 25%).
- Quintile based propensity analysis predicting the number of post-episode ED visits indicated Mobile Crisis youth- compared to a group of matched youth receiving ED services- have a reduction in the incidence risk rate of subsequent ED visits in an 18 month follow-up period; the reduction ranged from 13% to 29% (with a point estimate of 22%)
- The above findings were replicated, albeit with slightly more conservative results, when analyses were conducting using SAS software TWANG procedures
- Analyses focused on factors associated with subsequent ED service use among Mobile Crisis youth identified variables from four domains as potential predictors: Prior service use, demographic, child functioning, and Mobile Crisis episode characteristics
- Based on a "Tree Regression" approach (CR&T) variables from each of the four domains predicted subsequent ED use
- The most important predictors of subsequent ED service use among Mobile Crisis youth is prior behavioral health service use; this was confirmed by logistic regression models
- Qualitative analyses of data obtained from focus groups facilitated a broader understanding of the implementation of the Mobile Crisis service model
- Focus groups underscored the dedication of Mobile Crisis providers and their commitment to successful implementation of what can often be a very demanding service model
- Barriers to implementation of the Mobile Crisis model included factors associated with the communities, clinical providers, and nearby EDs
- Challenges are also presented by youth with specific diagnoses such as Autism spectrum disorder

Suggestions for Further Research

- Important limitations suggest future research directions: The findings are based on one fiscal year (2014) and one State (Connecticut). The findings here need to be replicated for other years and other States where similar models have been implemented
- The need for multiple analysis years is underscored by the notion that the Mobile Crisis model even within Connecticut has changed since 2014; the impact of those changes may potentially lead to greater program impact
- The findings are based entirely on "official records" and rely on Medicaid claims data; the comparative findings exclude those not on public insurance. Given the potential imitations of such data, a comparative study following youth admitted to different services with similar diagnosis – perhaps conducted at the patient/child level- may yield more definitive (and potentially richer, more nuanced) results

- The finding that length of stay is positively correlated with outcome suggests the need for more research on this variable. For example, does the impact of this variable depend on diagnosis or other youth/family characteristics? Is there a generally optimal value for length of stay that can inform best practice as the Mobile Crisis model develops?
- Regional differences with respect to repeated ED use among Mobile Crisis youth, when viewed in the context of our focus group discussions also suggest the need for further research from a systems perspectives. For example hospital, school, family, and professional/clinician awareness and understanding of Mobile Crisis services may vary considerably. An assessment of this variation as well as of factors affecting this variation may inform strategies for enhancing the long term success of Mobile Crisis implementation

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