Evaluation of Connecticut's Mobile Crisis Service for Youth:

Impact on Emergency Department Behavioral Health Use & Provider Perspectives on Strengths and Challenges

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Overview

- Purpose – to evaluate the impact of Mobile Crisis Service (EMPS) on the use of EDs for behavioral health
  - How effective was Mobile Crisis in preventing youth with BH diagnoses from being admitted to EDs *compared to youth who receive treatment in the ED*?
  - Among youth receiving Mobile Crisis, what *variables* are associated with subsequent increased/decreased use of ED services
  - What is the perspective of Mobile Crisis providers on the service's strengths and challenges?

Format for Today

- Background & Research Questions (Michael)
- Summary of how we constructed the data (Chris)
- Our ED impact findings (Michael)
- Brief investigation of ED service correlates (Michael)
- Summary of focus groups - Barriers facilitators (Brenda)

Problem: Pediatric behavioral health visits to the ED have skyrocketed nationally in recent years

Rates per 1000 visits of pediatric behavioral health visits, 2009-2013; (adapted from Rogers et al., 2017)

Previous research on mobile crisis services targeting youth

- Mobile programs that target youth exist in Rochester, NY; Milwaukee County, WI; King County, WA; Ventura County, CA; and the states of MA; NJ; TX; and, of course, CT
- A limited body of research suggests these programs effectively divert youth from ED visits and hospitalization
- To our knowledge, few (if any) studies have used rigorous (experimental or quasi-experimental) methods to evaluate the impact of mobile crisis services on youth ED use

Impact of Mobile Crisis on ED Use

- A key goal of MC is to prevent youth with behavioral health treatment needs from engaging with the ED when they have acute behavioral health problems
- Devised a study to look at whether youth who receive services through the MC are less likely to be treated in the ED *subsequent to that visit* than *other youth with acute behavioral health needs being seen* ***elsewhere***
- Need to figure out who those "other youths… being seen elsewhere" should be
- For this study, we looked at youths who did not get MC services who were seen in the ED for behavioral health as our comparison group
- During FY 2014….Followed both groups before their visit (18 months pre) and after (18 months post)

Mobile Crisis Impact: Two Group Comparison

- MC cohort – group seen in Mobile Crisis during FY 2014 (2532 children ≤ 17 years)
- Comparison group cohort – group seen in ED during FY 2014 – with no MC services before *(3961 children ≤ 17 years)*
- *Data/Source: Beacon Health, Medicaid claims data (Chris Bory will explain this in more detail next)*
- If we follow the youth over time, what proportion get services in ED in each group over the 18 month follow up?
- **Analysis Goal** : If we follow the youth over time, what proportion get services in ED in each group over the 18 month follow up, do ED visits differ across the two groups
  - Any ED Service visits
  - Number of ED service visits

Data Extraction Methods

Methods: EMPS Condition

- DCF sent Beacon list of youth that received EMPS during the time frame of 7/1/13 – 6/30/14
- If a youth had more than one EMPS episode in that time frame, the identified EMPS episode index date is the first EMPS episode
- Based upon the identified EMPS episode index date, return utilization 18-months (547 days) before and after for:
  - behavioral health and medical emergency department utilization
  - Inpatient psychiatric state and acute hospital utilization
- Creates a possible time frame of 1/1/12 – 12/31/15
- Fuzzy match from the EMPS Episode List to claims/authorizations based upon Medicaid ID (if present), DOB, last name, and first name

18-months PRE	7/1/2013	18-months POST

Methods: EMPS Condition

- Performance of ‘fuzzy match’
- Once youth matched, excluded from subsequent matches
- Recommended to only use 1st and 2nd matching

Rank	1st	2nd	3rd	4th	5th	BLANK
Field	Match Type					
Member ID	Exact					
Last Name	Exact	Exact	Exact	Exact	Soundex	
First Name	Exact	Exact	Soundex	Exact	Soundex	
DOB	Exact	Exact	Exact	Month/Year	Exact	
Frequency	1309	2152	197	57	335	539
Percent	28.5%	46.9%	4.3%	1.2%	7.3%	11.7%
Cumulative Frequency	-	3461	3658	3715	4050	4589
Cumulative Percent	-	75.4%	79.7%	81.0%	88.3%	100.0%

Note: SOUNDEX returns a character string containing the phonetic representation of character variable. This function lets you compare words that are spelled differently, but sound alike in English.

Methods: EMPS Condition

- Medicaid eligible/enrolled
  - Included number of Medicaid eligible days in both the 18-months pre and 18-months post.
  - Recommended to only included continuously enrolled Medicaid eligible youth or those had minor lapses in eligibility (e.g., <=31 days ineligible).
- Age
  - Recommended to only included youth (based upon calculated age) 3-17 years old as of index date
- Final EMPS condition = 2,532

Methods: Comparison Condition

- Youth must have had a BH ED visit between 7/1/13-6/30/14
- First BH ED visit served as the index date
- Based upon the identified BH ED index date, return utilization 18-months (547 days) before and after for:
  - behavioral health and medical emergency department utilization
  - Inpatient psychiatric state and acute hospital utilization
- Exclusions
  - Youth that had any EMPS episode during 7/1/13 – 6/30/14
  - Youth that were dually enrolled
  - Youth with limited benefit packages
  - Youth that were ≥ 18 year old

Methods: Comparison Condition

- Variables included
  - Age, Gender, Race, Ethnicity,
  - DCF region of the youth at the time of the index
  - 4 ICD-9 diagnoses for the index date
  - Indicator if youth had a CCS 654 (Developmental Disorder) diagnosis at the time of behavioral health ED index date
- Final sample recommendations
  - Continuously eligible and enrolled (<=31 days of ineligibility)
  - Only include youth ages 3 – 17
  - Exclude youth that had a developmental disorder diagnosis at time of BH ED index date
- Final comparison condition sample = 3,961
- All data was de-identified before delivery

Analytic Approach

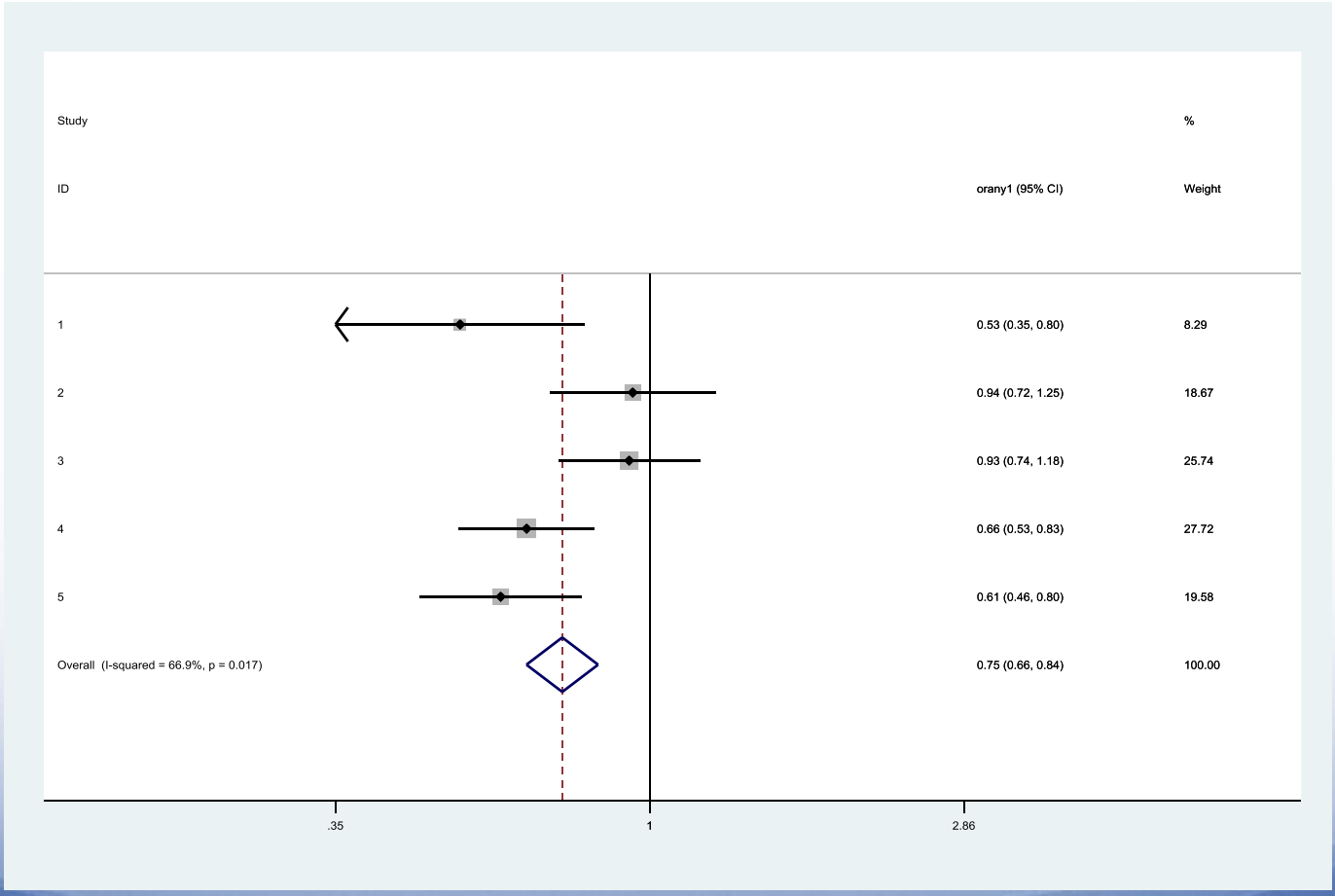
- Wanted to make this a “fair” comparison (like randomized clinical trials)
- Score Creation: We created five groupings based on the similarity of the two groups (MC Children and ED Comparison Children) -- lets call them “propensity groups” (also called quintiles)
- Propensity scores are based on logistic regression models (predicted the probability of Mobile Crisis status using key background variables)
- We performed statistical comparisons within those propensity groups and summarized those comparisons
- We look at **odds** and **incidence risk ratios for events** as outcomes – that is - how being in any group might **increase** or **decrease** the likelihood of outcomes

Results: Regression Models

- Note: All regression models predicting ED outcomes contained an indicator of MC status (MC vs. comparison) AND an indicator of any prior behavioral health ED use.

- Both variables were highly significant in the models, with MC status negatively related to outcomes and prior ED use positively related to outcomes.

First Outcome: What are the odds of an ED visit at follow up for MC vs. ED Youth?



Results – Odds Ratios

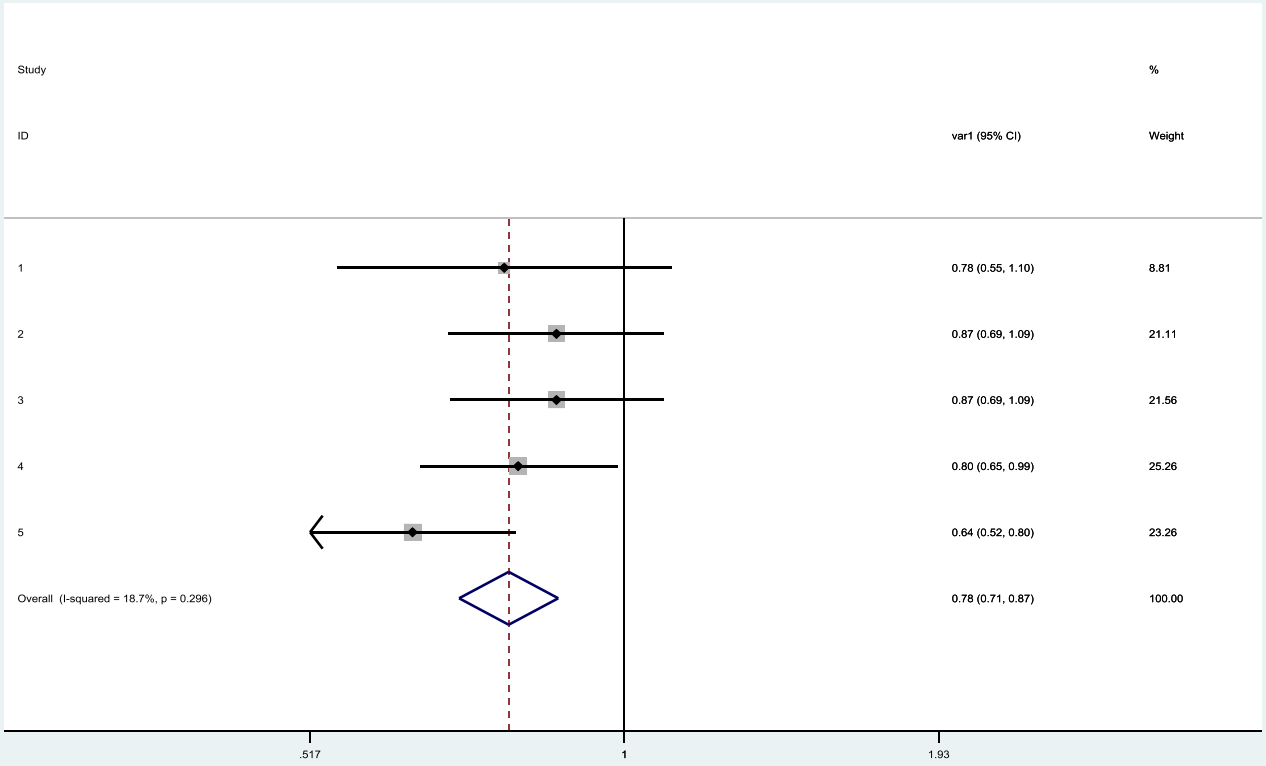
- Most (but not all) of the lines are to the left of the vertical bar – suggesting a **reduction in the odds of an ED visit for the MC youth compared to the ED Youth**

- The diamond suggests that, *based on the odds ratios*, on average, **those in the MC group have a 25% reduction in the risk of having a subsequent ED visit compared to ED Youth** (ranging between 16%-34%)

Results – Number of BHED Visits

- Slightly different interpretation since the outcome is number of visits (continuous) – instead of odds, we talk about “incidence risk” (risk that visits will occur)
- Most (but not all) of the lines are to the left of the horizontal bar suggesting a **reduction in the incidence of ED visits for the MC youth compared to the ED Youth**
- The diamond is to the left, suggesting, based on the odds ratios, that **those in the MC group have a 22% reduction in the incidence of ED visits** (ranging between 13%-29%)

What about Number of BHED Visits?



Overall Finding

- When we consider analyses that match our comparison groups according to the similarity of their background characteristics, the data show that the Mobile Crisis service has an impact in preventing subsequent ED use.

Part III. Predicting Subsequent Behavioral Health ED Use in Mobile Crisis Youth

- This section focuses on addressing the question: What predicts whether a youth in the Mobile Crisis group visits the emergency department for a behavioral health problem during the 18 month follow up?

Lots of Data to Look At

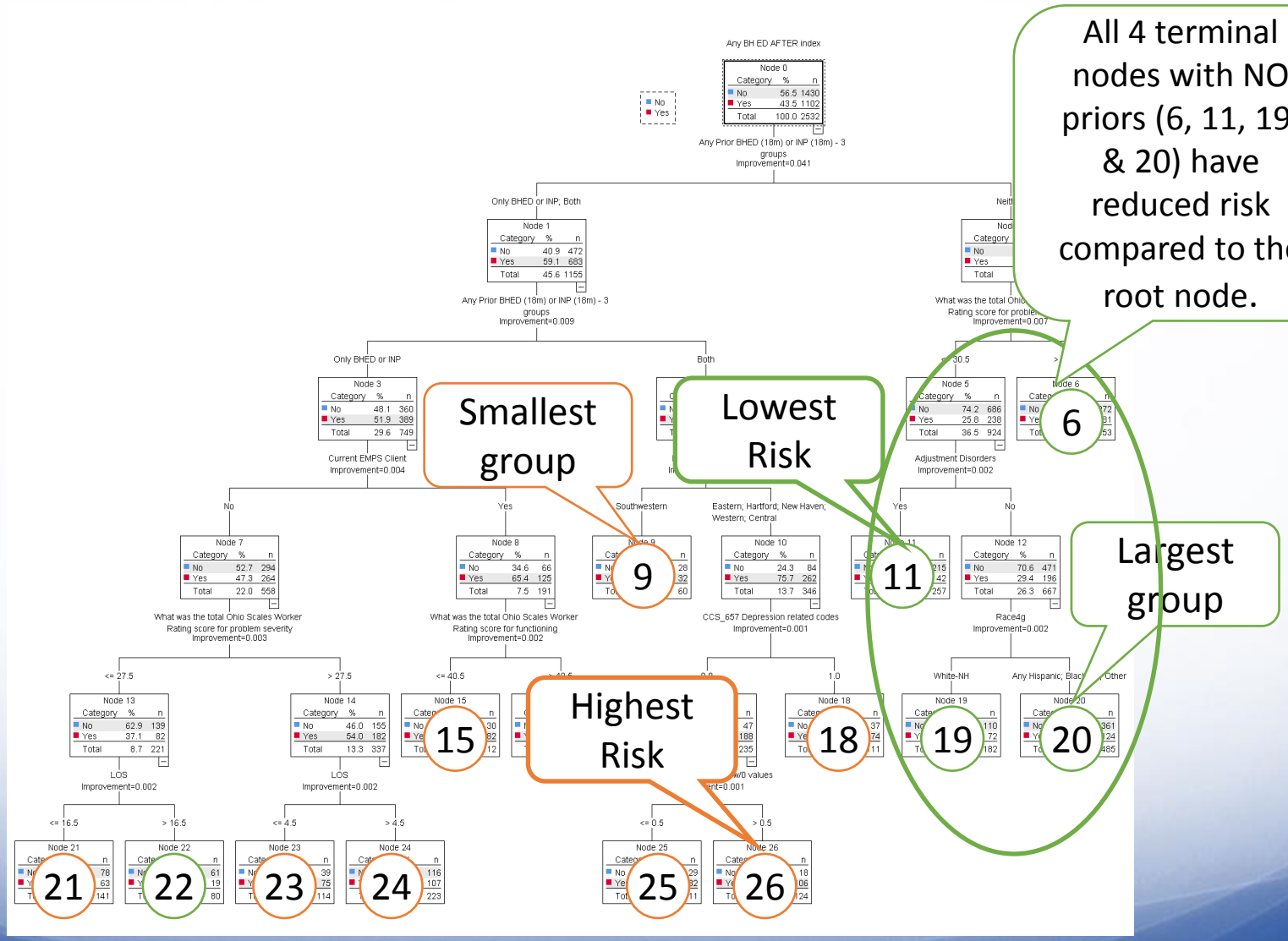
- We had a large number of potential factors look at
- We have lots of prior literature to suggest likely predictors (e.g., prior service use)
- As a first step, we sorted out the data into 4 categories
  1. Youth Prior Service Use
  2. Youth Demographic/Family Background
  3. Youth Functioning
  4. Mobile Crisis Episode Characteristics

Method to help us get a clearer picture of predictors: Decision Tree Analysis

- A decision tree is a tool that uses a step-by-step process to determine the best predictor of a certain outcome based on variables that are likely to influence that outcome.
- At each step Classification & Regression Tree (C&RT)*:
  - Uses all predictor variables,
  - Selects the variable that most improves prediction of the outcome,
  - 'Splits' the initial group into two groups at the optimal point so within each group the individuals are as similar as possible.
- The result is a graphic, tree-like, model of the complex relationships between the variables that predict the outcome.

*Brieman et al., 1984

Decision Tree: Predicting any BH ED use post-index



Decision Tree Results

Best Predictors of *Increased* likelihood of ED Use:

- Prior behavioral health service use (ED or BH Inpatient Visits)
- Higher Problem Severity Scores on the Ohio Scales Worker Ratings
- *Whether someone was already a Mobile Crisis client when he/she began his/her episode in 2014*

Best Predictors of *decreased* likelihood of ED Use:

- Adjustment disorder diagnosis
- Longer length of stay any Mobile Crisis episode
- Higher Functioning Scores on the Ohio Scales Worker Ratings

Part IV. Provider Perspectives

Methodology:

- 7 focus groups conducted between April and Nov 2017; thematic analysis w/ a phenomenology lens
- 33 providers interviewed
- Average age was 33.8 years
- The majority were female (93.6%) & white (60.6%)
- About half & half – clinicians: supervisors
- 69.7% had worked in EMPS for >2 years (excluded if worked <6 months in EMPS)

Do you think EMPS reduces psychiatric ED use? *Yes, and…* Strengths of EMPS.

"…one of the things that we do really well is include[e] the family."

"We … come from a strength-based focus…"

".. We [teach families] to recognize their strengths, to look at them. Sometimes they don't even see [their strengths]... and then to build upon [their strengths]."

"We … empower [families] … 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 … have the family involved as much as possible because it's the most important thing."

Obstacles or challenges to EMPS

Micro (Indi & Familial)

Individual – such as:

- Level of acuity - complex and acute cases

Familial – such as:

- Lack of support
- Poverty: resources/phones
- Language
- Parental divorce, DV, etc.
- Parental MH issues
- Lack of understanding /acceptance of MH issues
- Familial propensity for ED use

Obstacles or challenges - continued

Macro

- Lack of awareness of 211: preference for 911 – and discrepant referrals from 211
- Lack of understanding that EMPS is voluntary
- Premature discharges
- Lack of transportation & practitioners, particularly in rural areas
- Risk averse practitioners
- *"It's hard for EMPS because we don't have anybody to go to for a second opinion."*
- *"[It seems] … 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 be the on call for everyone else in the state …"*

Additional themes

Things that are helpful

- High risk management teams
- Facility liaison
- Collaboration between EMPS and the EDs
- Community collaboratives

Additional themes - continued

Changes that would be helpful

- Change school contracts so all say 211
- Have BH treated like physical health on parental school forms
- Prioritize appointments for EMPS clients

Possible Innovations

- Addressing basic needs
- Preventive approach

Conclusion

1. Mobile Crisis reduces ED use
2. Prior ED use puts youth at higher risk for subsequent ED use
3. Implementing a program such as Mobile Crisis involves a sea change. Getting families and referring agencies to use Mobile Crisis rather than the ED for youth in psychiatric crisis requires skilled practitioners to work with the children, youth, and their families as well as to collaborate with the EDs and hospitals, other service providers, and referring agencies
4. Future Directions: NIMH funding to look at expanded time frame, more details about service outcomes post-mobile crisis, consumer perspectives about service experience

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Part V: Questions, Comments & Discussion?