



Housing First Partners Conference April 11, 2018

Prediction, Retention, and Cost Utilization of
Emergency Services in the First Massachusetts
Social Innovation Financing Housing First
Program

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INTRODUCTION

- Presents results of examination of the impact of the Commonwealth of Massachusetts' and MHSA's first and only 'Housing First' social innovation Pay for Success (PFS) initiative.
 - a) It evaluates the extent to which the PFS triage assessment tool predicts high utilization of emergency services for Housing First clients before housing entry.
 - b) Examines the effects of housing first on utilization of emergency medical services, cost-savings and housing retention.



PAY FOR SUCCESS

- Permanent supportive housing for 500-800 homeless people
- Seeks to provide housing to the costliest segment of the homeless population to reduce health care costs associated with remaining homelessness
- Eligibility
 - Chronically homeless
 - Long-term homeless who frequently use emergency health services
- Triage and assessment tool collects information on demographics and five types of housing and health status. Has collected over 2150
 - a) Component scores for homelessness history, use of emergency services, physical health, mental health, and substance use
 - b) Dual diagnosis score for presence of both mental health and substance use
 - c) Total score is sum of component scores and dual diagnosis score
- Providers prioritize higher-ranked people for services
- Have discretion to house lower-ranked people believed to be at high need of services

PREDICTION: MATHEMATICA STUDY RESEARCH QUESTIONS

- How are service use outcomes associated with triage assessment total scores? Do people with higher scores use emergency health services to a greater extent?
- How are service use outcomes associated with each of the five triage component scores? Are some domains better at predicting subsequent service use than others?
- Which individual questions used to create the domain scores are best at predicting subsequent service use?

PREDICTION: TRIAGE ASSESSMENT DATA

1. **Background information**

- Name, gender, race, ethnicity, veteran status, ever been in foster care, jail, or prison; permanent physical disability status, health insurance

2. **Domain 1: homelessness history**

- Been longer than a year since had own place to stay
- In past 3 years, how many times been homeless then housed again
- In past 6 months, location where most often slept

3. **Domain 2: Utilization of emergency services**

- Number of times visited an emergency room
- Number of nights spent hospitalized
- Number of stays in a detox or treatment facility
- Number of nights spent in an emergency shelter

PREDICTION: TRIAGE ASSESSMENT DATA

4. **Domain 3: Physical health**

- Ever diagnosed with need for dialysis, heart disease, cirrhosis, high blood pressure, HIV/AIDS, diabetes, asthma/COPD, hepatitis C, cancer that required chemotherapy or surgery
- Ever been knocked unconscious by head trauma
- Ever been treated for illness related to cold

5. **Domain 4: Mental health**

- Ever been diagnosed with psychosis or schizophrenia, bipolar disorder, depression, anxiety, other mental health conditions
- Ever been hospitalized for emotional problems

6. **Domain 5: Substance use**

- Currently using any substance that is not prescribed
- Have been treated for drug or alcohol problems



PREDICTION: DATA

- **Service use data collected from participants upon entering housing**
- Background information and demographics
- Homelessness history
- Income sources, health insurance, and quality of life
- Disability/health history
- Service usage within past six months
- Receipt of primary medical care, outpatient mental health treatment, outpatient substance abuse treatment
- Number of times visited emergency room, times hospitalized, days hospitalized, used an ambulance, days spent in McInnis House, days in a detox center, nights spent in an emergency shelter, days spent incarcerated

PREDICTION: CONSTRUCTING THE DATA

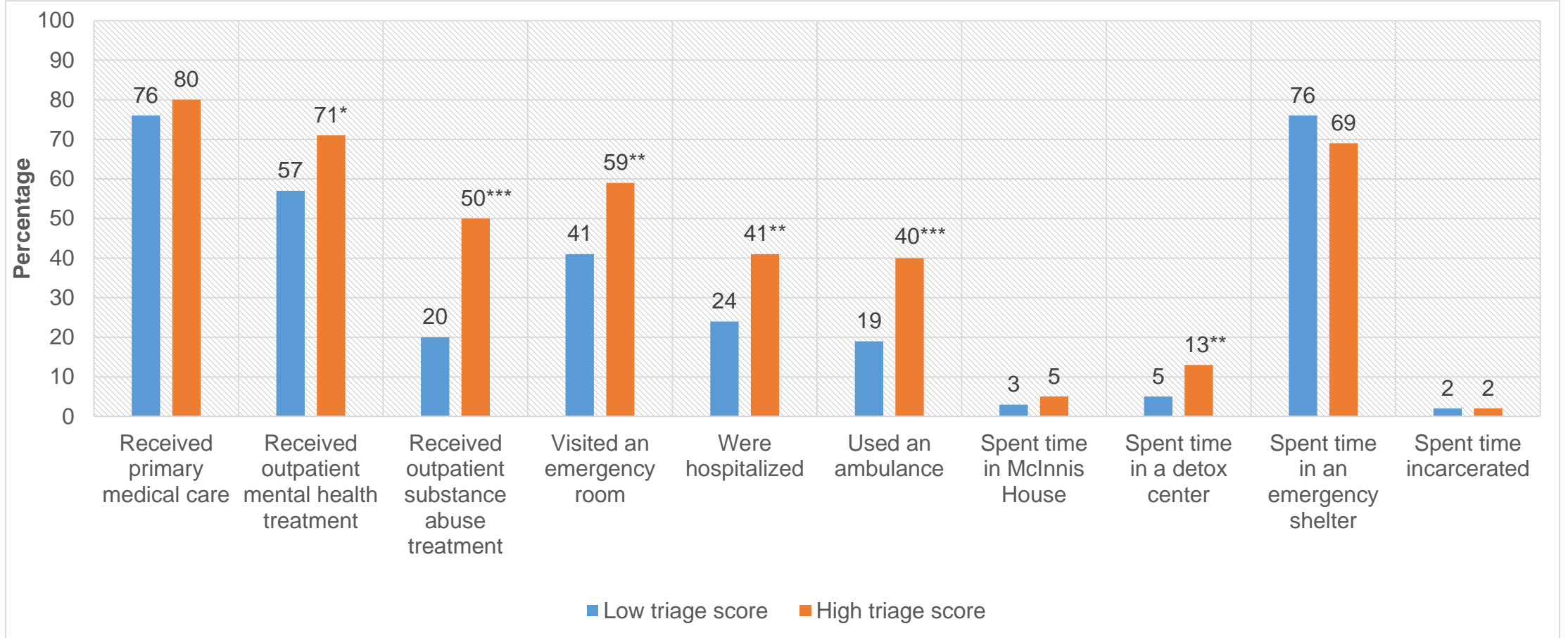
- Linked triage assessment data and service use data
- Examined length of time between triage assessment and when participants entered housing
- Restricting the analysis to those who entered housing at least six months after triage is cleanest, but yields smaller sample
- Restricted the analysis to those who entered housing at least four months after triage
- Reviewed extent of missing data and addressed it
- Final data file used for analysis had 147 participants with complete outcome information



PREDICTION: ANALYTIC METHODOLOGY

1. Triage assessment scores
 - a) Described distribution of total scores for all participants and by geographic location and age. Repeat for component scores.
2. Service usage
 - a) Described distributions of use of health services
3. Regression analysis (research questions 1 and 2)
 - a) Estimated associations between service use and triage scores
 - b) Presented results in figures that account for differences across participants in demographic characteristics
4. Identified specific questions most strongly predictive of service usage (research question 3)
 - a) Repeated analysis using responses to individual triage questions in place of total and component scores
 - b) Used innovative machine-learning methods

PREDICTION: RESULTS



*** Difference is statistically significant at the $p < .01$ level.

** Difference is statistically significant at the $p < .05$ level.

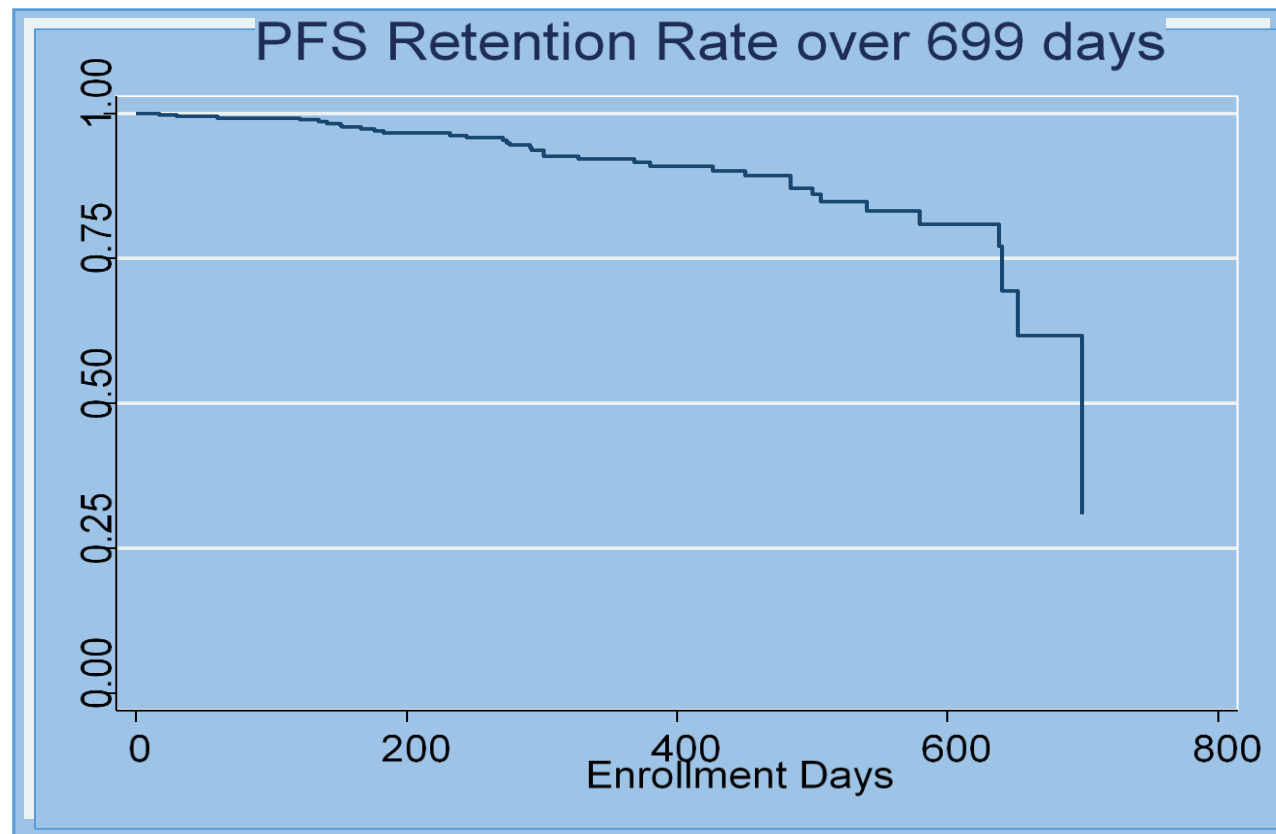
* Difference is statistically significant at the $p < .10$ level.

PREDICTION: CONCLUSIONS

1. Triage and assessment tool effectively identifies chronically homeless participants who will frequently use health services
 - a) Associations with total score in expected directions for all outcomes and significant for most (6 out of 10) outcomes
 - a) Component scores were strong predictors of specific outcomes
2. Study challenges
 - a) Only examine people housed through PFS
 - b) Many PFS participants are housed soon after assessment
3. Using administrative data on service receipt in place of the data self-reported by PFS participants when they enter housing could strengthen the methodology of this study

RETENTION

: Kaplan Meier Survival Estimates for PFS Housing Retention



92.1 percent
retention rate
over 365 days.
This is a higher
rate than the
target of 85
percent



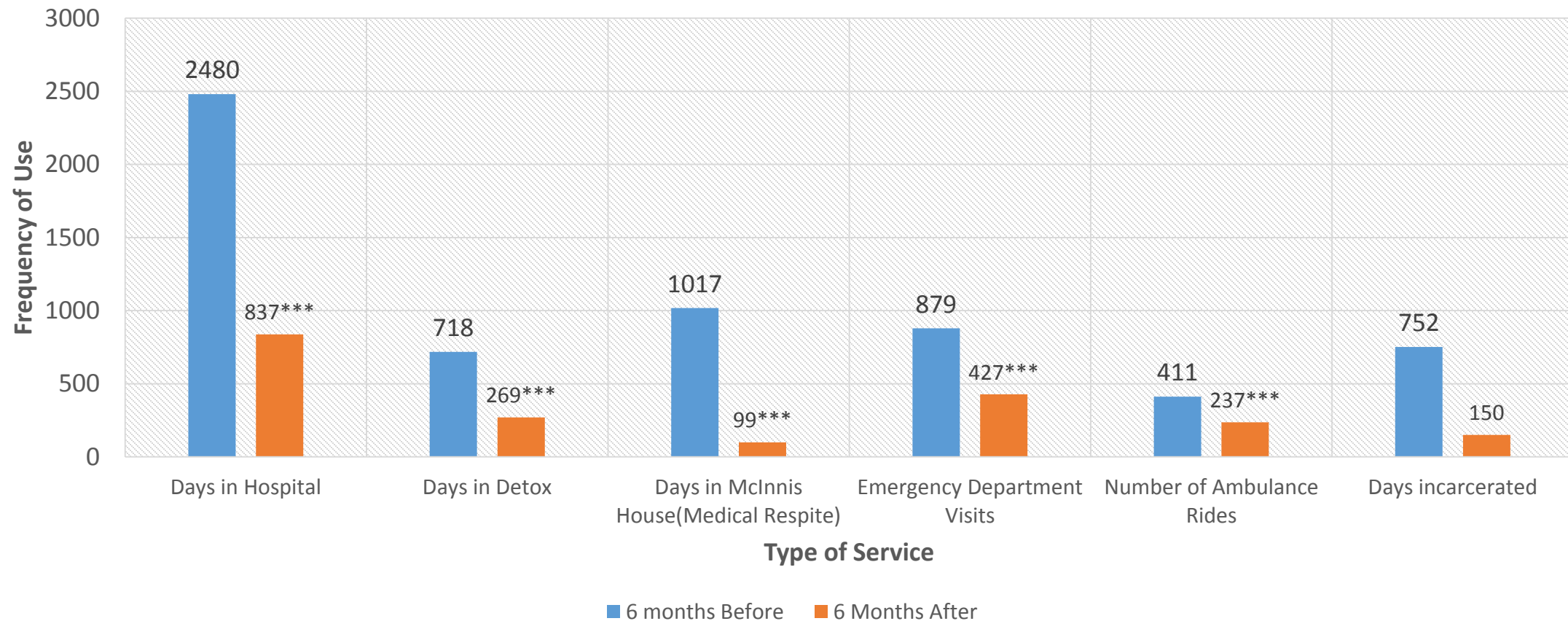
HOUSING RETENTION, UTILIZATION OF EMERGENCY SERVICES, AND COST-SAVINGS

- METHODS

1. Survival analysis to compute housing retention;
2. Wilcoxon Signed-Rank test to find out the significance of differences between the before and after housing utilization of
 - a) inpatient hospitalizations,
 - b) outpatient hospital visits,
 - c) emergency department (ED) visits,
 - d) ambulance rides, and
 - e) days incarcerated;
3. Cost-benefit analysis to translate usage into dollar amounts.

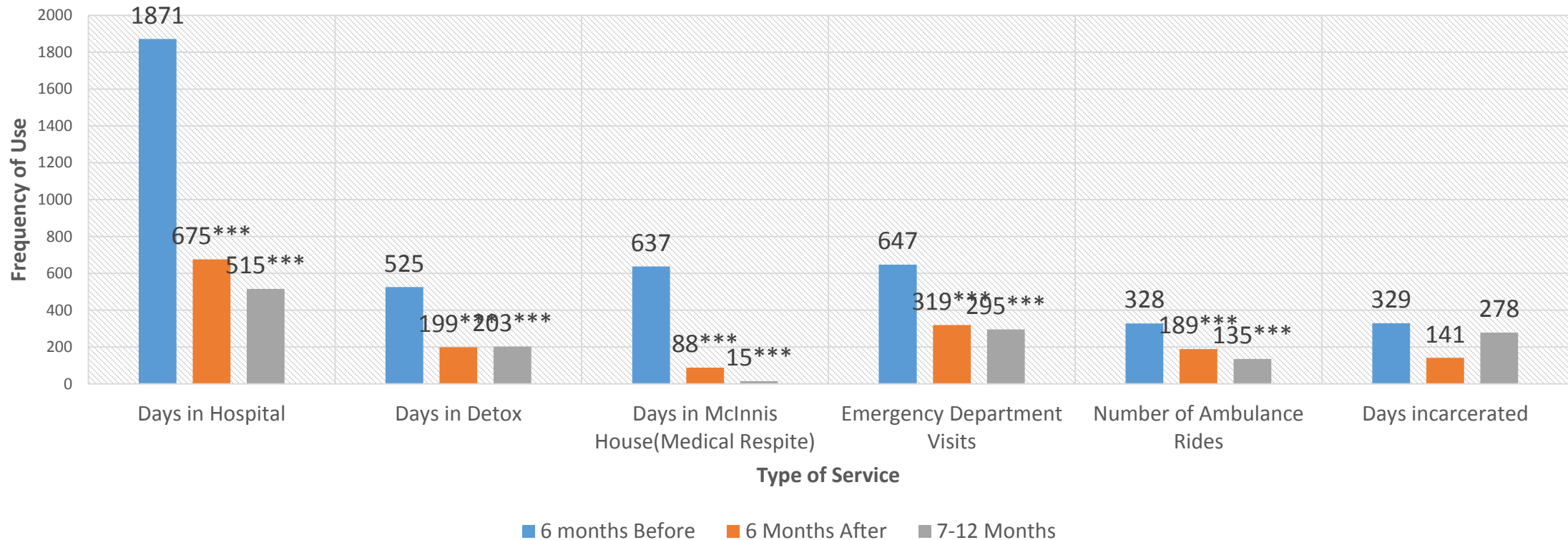
UTILIZATION OF EMERGENCY SERVICES AMONG HOUSING FIRST CLIENTS

Utilization of Emergency Medical and Public Services 6 months before and after Housing under MHSA's Pay for Success (PFS) Program (n=525 as at February 7, 2018)



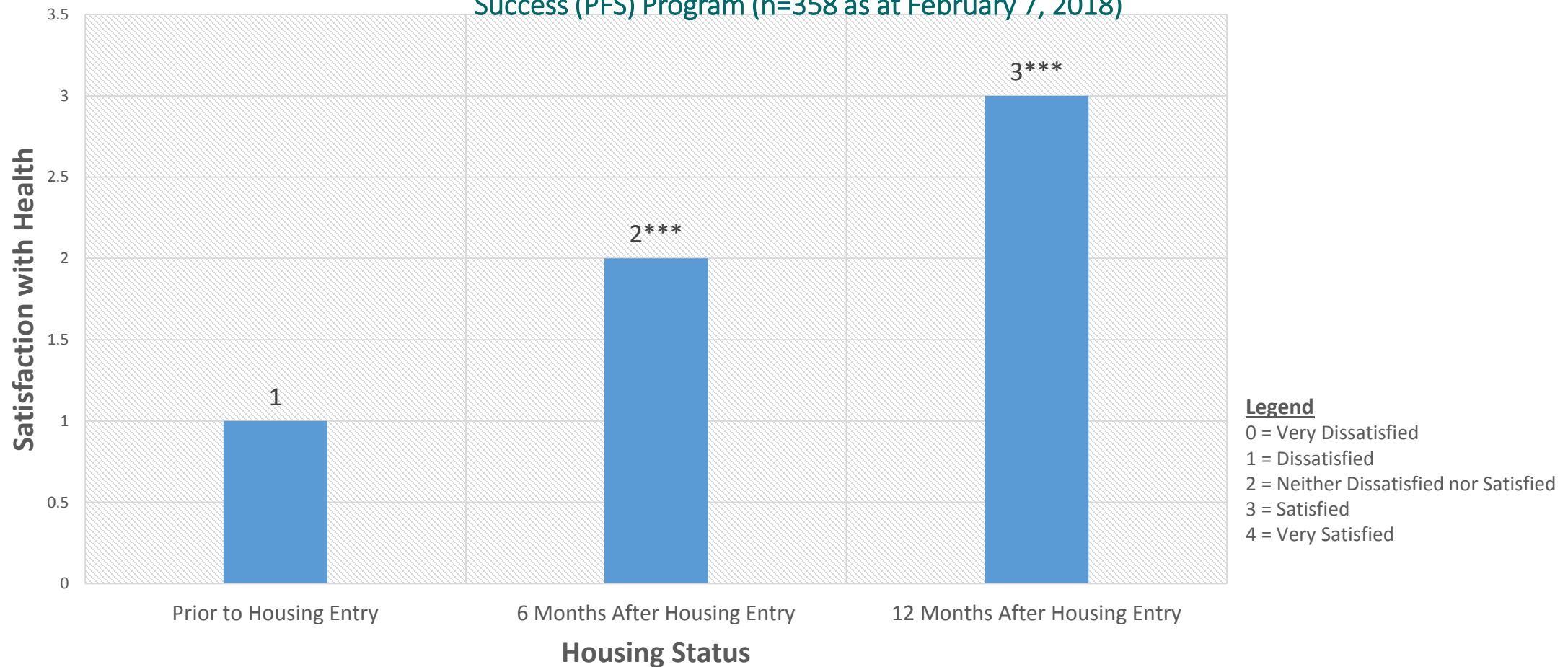
UTILIZATION OF EMERGENCY SERVICES AMONG HOUSING FIRST CLIENTS

Utilization of Emergency Medical and Public Services 6 Months Before, and 6 and 12 Months After Housing Entry Under MHSA's Pay for Success (PFS) Program (n=358 as at February 7, 2018)



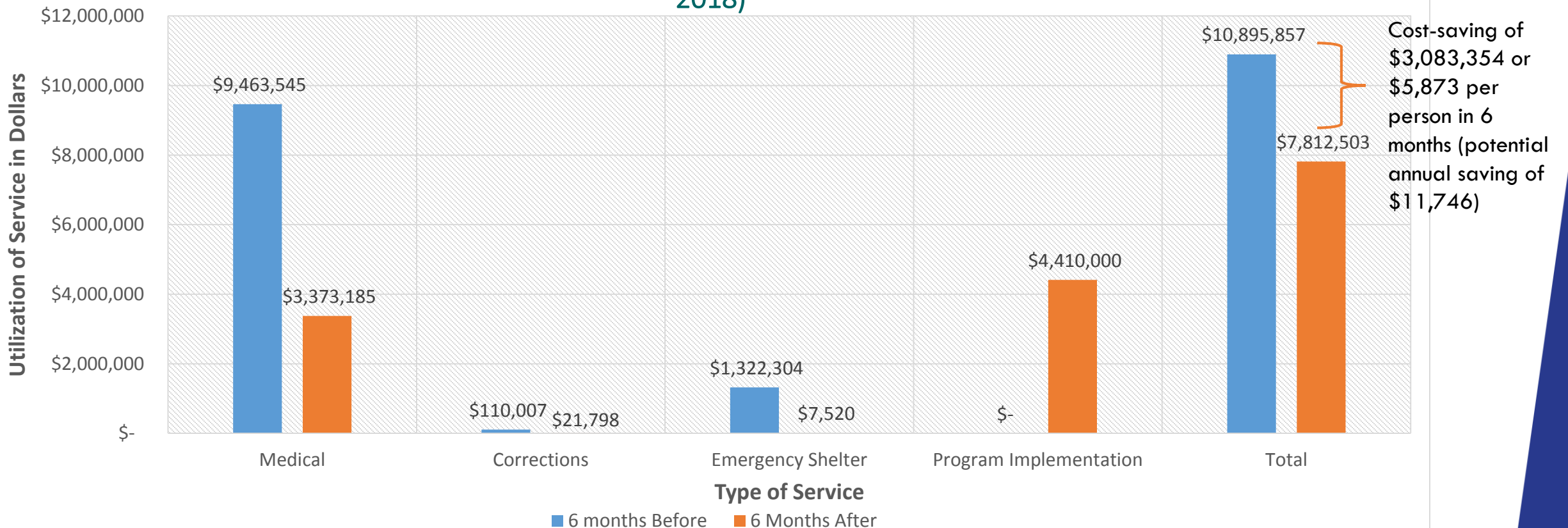
HEALTH SATISFACTION AMONG PAY FOR SUCCESS CLIENTS

Satisfaction with Health 6 Months Before, and 6 and 12 Months After Housing Entry Under MHSA's Pay for Success (PFS) Program (n=358 as at February 7, 2018)



UTILIZATION OF EMERGENCY SERVICES AMONG HOUSING FIRST CLIENTS EXPRESSED IN DOLLARS

Utilization of Emergency Medical and Public Services 6 months before and after Housing under MHSA's Pay for Success (PFS) Program Expressed in Dollars (n=525 as at February 7, 2018)





CONCLUSIONS

- Retention rate was 92.2 percent after one year of implementation.
- Significantly reduced the number of nights spent in emergency shelter, inpatient hospitalizations and days spent in detox during the first six months and one year of housing for chronically homeless and high utilizers of health services.
- Brought much needed services to clients who could not otherwise have accessed services.
- Saved Medicaid up to \$3 million in first year.
- Overall in its first year of existence, MHSA's Pay for Success program has demonstrated success in housing and retaining the costliest segment of the homeless population, and long-term homeless adults who are high utilizers of emergency services.