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Memo

Date: August 3, 2015

To: Scott Gruendl and Doris Estremera, BHRS

From: Sean McClellan and Grace Wang, AIR

Re: Psychiatric hospitalizations and psychiatric emergency services (PES) use among FSP clients, using Avatar data

Summary

This memo reports on psychiatric hospitalizations and psychiatric emergency services (PES) use for clients of San Mateo County's Full Services Partnership (FSP) program, served from July 2006 through July 2015. The information presented in this memo is from San Mateo County BHRS' Avatar system.

In general, we found evidence of consistent and statistically significant decreases in hospitalizations and PES use associated with enrollment in the FSP. These findings apply to proportions of clients with hospitalizations and PES use and the average number of hospital days and PES admissions per client. Specific findings are reported in the memo below, stratified by client tenure in the FSP and stratified by the year that clients entered into the FSP.

Background

The Full Service Partnership (FSP) program, funded by the 2005 Mental Health Services Act (MHSA), allows County behavioral health departments in California to provide comprehensive services for individuals living with mental illness.[1,2] As part of San Mateo County's implementation of the FSP, American Institutes for Research (AIR) is working with the County to understand how enrollment in the FSP is benefiting the County's FSP clients.

Psychiatric hospitalizations and use of psychiatric emergency services (PES) are key indicators of well-being for persons diagnosed with psychiatric conditions. Reductions in use of these services may indicate that individuals' mental health status has improved and that they no longer require intensive care. Psychiatric hospitalizations and PES use can be measured using two primary data sources: (1) client self-reports to healthcare providers or other staff, and (2) administrative data collected through billing or electronic medical record files. Although administrative data may not include all utilization, such as services received by clients from another county or health system, administrative sources have the strength of consistently capturing utilization patterns for clients served by the county, without bias from inaccurate or incomplete reporting.

Thus, this memo draws on administrative data accessed through San Mateo County BHRS' Avatar system. An appendix following this memo reports the specific tables within the system used for these analyses.

Findings

This memo presents data on the following outcomes:

- Proportion of clients with any hospitalization
- Mean hospital days per client
- Proportion of clients using any PES
- Mean PES admissions per client

These outcomes are presented in two ways: (1) stratified by client tenure in the FSP, following the state's reporting templates;[3] and (2) stratified by the calendar year clients entered the FSP.

Each bar in the charts below represents outcomes for each year clients were enrolled in the FSP. For each cohort, outcome levels in the year before FSP enrollment (termed "baseline") were compared with outcome levels while enrolled in the FSP.

We included 95% confidence intervals (CIs) that are proportional to the standard deviation and sample size of the estimates. Smaller confidence intervals correspond to more accurate estimates.

We also included statistical tests of differences between baseline and each year following clients' initial enrollment in the FSP. Asterisks (in red) indicate statistically significant differences between baseline and in later years. For observations with larger CIs, small sample sizes may limit our ability to detect true differences at statistically significant levels (type II error).

Results for outcomes stratified by client tenure in the FSP

Figures 1 to 4 show outcomes for each year of client enrollment in the FSP, stratified by cohorts defined by FSP tenure. These cohorts include clients who were enrolled in the FSP for at least one full year through those enrolled for over five years.

Hospitalization: The proportion of FSP clients with any hospitalization decreased significantly after FSP enrollment compared to baseline (**Fig 1**). Decreases between baseline and levels after enrollment ranged from 11 percentage points for clients in FSP for one year or more to 20 percentage points for clients in FSP for 5 years or more.

The mean number of hospital days experienced by FSP clients decreased significantly after FSP enrollment compared to baseline (**Fig 2**). Decreases between baseline and levels after enrollment ranged from five days for clients in FSP for one year or more to 13 days for clients in FSP for five years or more.

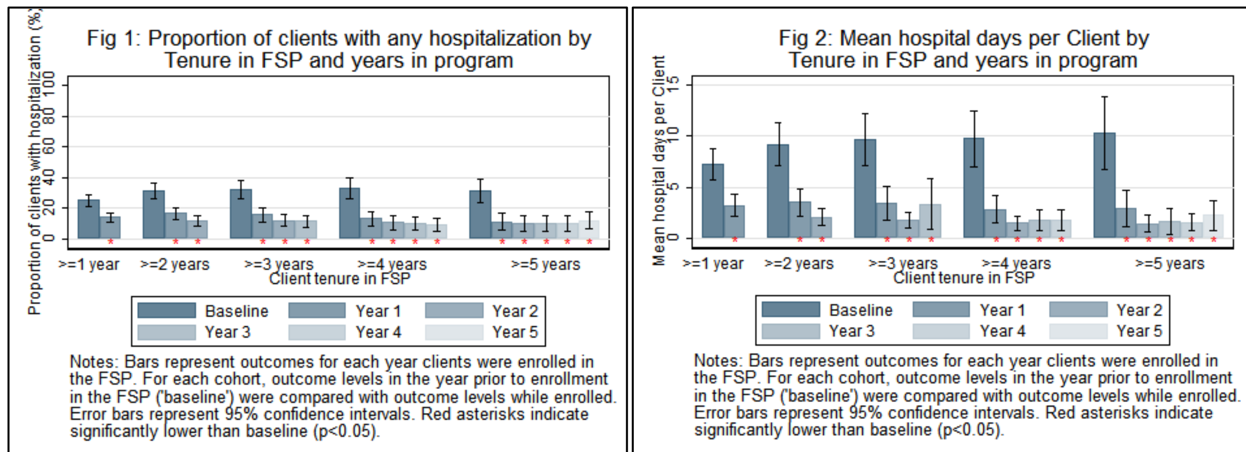

Fig 1: Proportion of clients with any hospitalization by Tenure in FSP and years in program

Notes: Bars represent outcomes for each year clients were enrolled in the FSP. For each cohort, outcome levels in the year prior to enrollment in the FSP ('baseline') were compared with outcome levels while enrolled. Error bars represent 95% confidence intervals. Red asterisks indicate significantly lower than baseline (p<0.05).

Fig 2: Mean hospital days per Client by Tenure in FSP and years in program

Notes: Bars represent outcomes for each year clients were enrolled in the FSP. For each cohort, outcome levels in the year prior to enrollment in the FSP ('baseline') were compared with outcome levels while enrolled. Error bars represent 95% confidence intervals. Red asterisks indicate significantly lower than baseline (p<0.05).

PES use: The proportion of FSP clients with any PES use decreased significantly after FSP enrollment compared to baseline (**Fig 3**). Decreases between baseline and levels after enrollment ranged from 12 percentage points for clients in FSP for one year or more to 17 percentage points for clients in FSP for 5 years or more.

The mean number of PES admissions experienced by FSP clients decreased significantly after FSP enrollment compared to baseline for most but not all years once clients were enrolled in the FSP (**Fig 4**). On average per client, decreases between baseline and levels after enrollment ranged between.5 PES admissions to 1 PES admission per year.

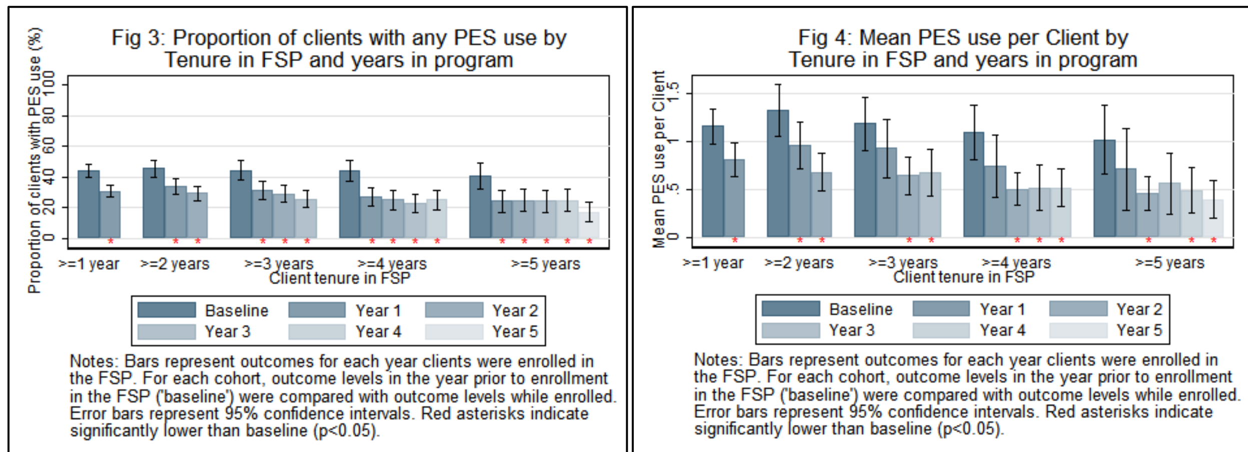

Fig 3: Proportion of clients with any PES use by Tenure in FSP and years in program

Notes: Bars represent outcomes for each year clients were enrolled in the FSP. For each cohort, outcome levels in the year prior to enrollment in the FSP ('baseline') were compared with outcome levels while enrolled. Error bars represent 95% confidence intervals. Red asterisks indicate significantly lower than baseline (p<0.05).

Fig 4: Mean PES use per Client by Tenure in FSP and years in program

Notes: Bars represent outcomes for each year clients were enrolled in the FSP. For each cohort, outcome levels in the year prior to enrollment in the FSP ('baseline') were compared with outcome levels while enrolled. Error bars represent 95% confidence intervals. Red asterisks indicate significantly lower than baseline (p<0.05).

Results for outcomes stratified by client year of entry into the FSP

Figures 5 to 8 show outcomes for the year before clients enrolled in the FSP and their first year enrolled, stratified by the year that clients first enrolled in the FSP. Charts include baseline and year one outcomes only for clients who had been enrolled in the FSP for at least one year.

Hospitalization: The proportion of FSP clients with any hospitalization decreased significantly after FSP enrollment compared to baseline, for some but not all years of FSP entry (**Fig 5**). We observed statistically significant decreases in the proportion of clients experiencing any hospitalizations before compared to after enrollment in the FSP in 2009, 2011, 2013 and 2014. However, in part because of smaller sample sizes when stratifying by entry year, we found that not all comparisons of baseline to year one differed at statistically significant levels. Differences between baseline and year one levels ranged between four percentage points in 2006 and 20 percentage points in 2014.

The mean number of hospital days experienced by FSP clients decreased significantly after FSP enrollment compared to baseline, for some but not all years of FSP entry (**Fig 6**). We observed statistically significant decreases in the proportion of clients experiencing any hospitalizations before compared to after enrollment in the FSP in 2009, 2013 and 2014. Differences between baseline and levels after enrollment ranged from +1 day per client on average in 2007 to -6 days per client on average in 2009.

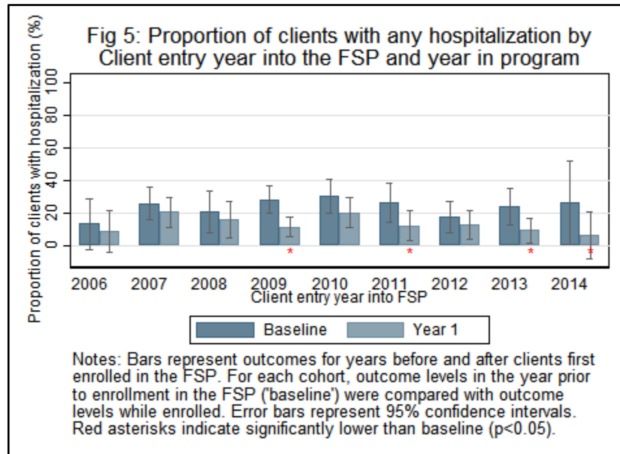

Fig 5: Proportion of clients with any hospitalization by Client entry year into the FSP and year in program

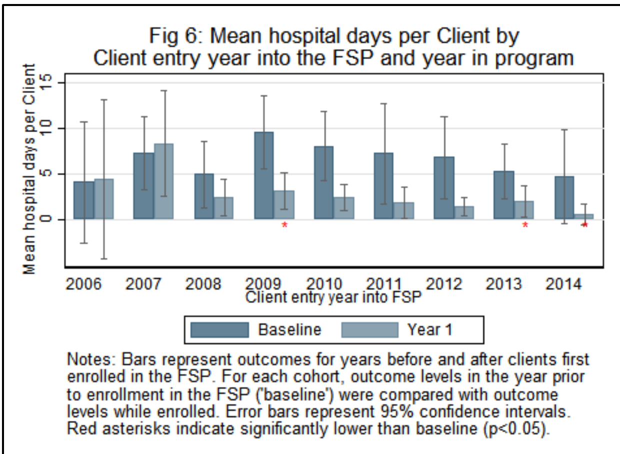

Fig 6: Mean hospital days per Client by Client entry year into the FSP and year in program

<u>PES use:</u> The proportion of FSP clients with any PES use decreased significantly after FSP enrollment compared to baseline, for some but not all years of FSP entry (**Fig 7**). We observed statistically significant decreases in the proportion of clients experiencing any PES use before compared to after enrollment in the FSP in 2009, 2010, 2011 and 2014. Decreases between baseline and levels after enrollment ranged from roughly 4.5 percentage points in 2006 to 24 percentage points in 2014.

The mean number of PES admissions experienced by FSP clients decreased significantly after FSP enrollment compared to baseline, for some but not all years of FSP entry (**Fig 8**). We observed statistically significant decreases in mean PES use per clients before compared to after enrollment in the FSP in 2010, 2013, and 2014. On average, decreases between baseline and levels after enrollment ranged from roughly 0.05 PES per client on average in 2011 to roughly 1.0 PES per client on average in 2013.

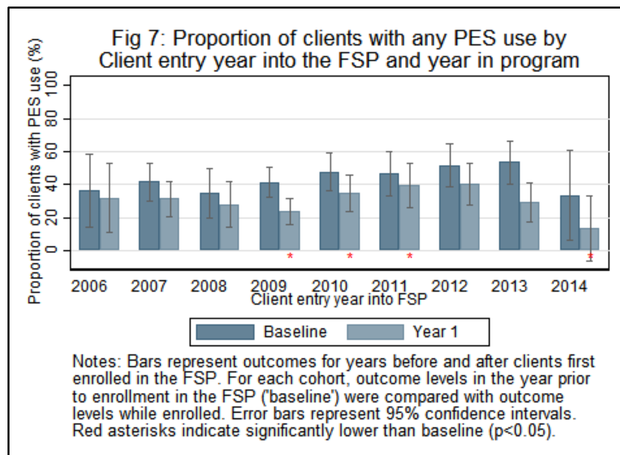

Fig 7: Proportion of clients with any PES use by Client entry year into the FSP and year in program

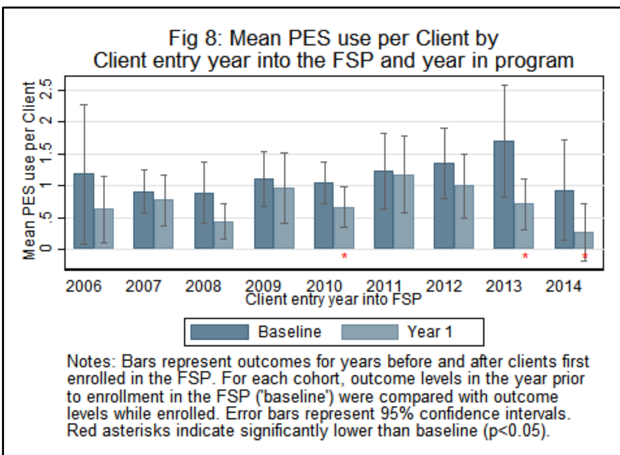

Fig 8: Mean PES use per Client by Client entry year into the FSP and year in program

Methods appendix

All data management and analysis was conducted in Stata. Code is available upon request.

Data sources used within Avatar

To count instances of psychiatric hospitalizations and PES admissions, we relied on the Avatar "view_episode_summary_admit" table. Table 1 shows the program codes corresponding with the above measures, along with the total number of records associated with each code. Additionally, FSP episodes were identified through the Avatar "episode_history" table.

Table 1: Counts of programs codes among clients ever in the FSP

Program code	Program value	Count
Psychiatric Hospitalizations		
410200	ZZ410200 PENINSULA HOSPITAL INPT-MSO I/A	340
410205	410205 PENINSULA HOSPITAL INPATIENT	362
410700	410700 SMMC INPATIENT	8,104
921005	921005 NONCONTRACT INPATIENT	245
926605	926605 JOHN MUIR MED. CTR INPT MAN CARE	21
Psychiatric Emergency Services		
410702	Z410702 SMMC PES -termed 10/31/14	32,991
410703	410703 PRE CONV SMMC PES~INACTIVE	349
41CZ00	41CZ00 SAN MATEO MEDICAL CENTER - PES	2,207

Notes: Data represent all utilization from FSP clients for these codes, as pulled from Avatar on July 14, 2015.

[1] San Mateo County Health System, Behavioral Health and Recovery Services Division. "Mental Health Services Act (MHSA) Fiscal Year (FY) 2013/2014 Update to the Three-Year Program and Expenditure Plan." July 2013. Available at: http://smchealth.org/sites/default/files/docs/BHS/MHSA/MHSAAnnual%20Update2013_14.pdf

[2] Davis Y. Ja & Associates. "Full Service Partnerships Final Evaluation Report." For the San Mateo County Health System, Behavioral Health and Recovery Services Division. July 2014 (revised 7.25.14).

[3] Full Service Partnership (FSP) Enhanced Partner-Level Data (EPLD) Templates Version 2.1User Manual - Microsoft Excel. September 15, 2013. Document was funded by the Mental Health Services Oversight and Accountability Commission.