ATTACHMENT B

Outcomes Associated with Permanent Supportive Housing (PSH) Programs in Santa Clara County
17th Report

Note: Reporting periods may vary between sections.

Summary

- A three-year Randomized Controlled Trial (RCT) report of the Project Welcome Home (PWH), shows statistically significant reduction in utilization of the County services by individuals placed in treatment.
- From July 1, 2011 through September 30, 2018, CCP served 1490 unduplicated households, of whom 1243 had been housed.
- Results continue to show correlation between CCP clients receiving housing and supportive services and experiencing improved patterns of utilization of public services.

Section I: Performance Measures and Demographics Information for Project Welcome Home (PWH) (May 1, 2015 through September 27, 2018)

PWH serves the chronically homeless individuals who are "high-users" of various County services, most notably emergency medical and psychiatric services, and the County jail. The program increased its capacity to serve 140 clients at any given time. As of September 27, 2018, 105 chronically homeless individuals have been enrolled and 97 are housed through PWH.

Attachment A provides reports of the program's progress.

Section II: Summary of a 3-year Evaluation Report of Project Welcome Home

A summary of an analysis of PWH data through the first three years of the project presents the findings on months of continuous stable tenancy and utilization of various County services. The evaluator compared the mean outcome of all individuals assigned to the treatment group to individuals assigned to the control group. As expected, many of the PWH enrollees were rehoused multiple times, a few up to nine (9) times. Despite frequent re-housing, 76% of the enrollees were able to retain housing for 12 months or longer. The study of twenty four (24) months post enrollment showed that there was a statistically significant decreases in the number of psychiatric ED visits and the number of ED visits that occur via police transport. Another area that showed statistically significant differences was in utilization of outpatient mental health services, with a greater number of visits in the treatment group across multiple categories. This is considered positive as clients are encouraged to seek outpatient services and get stabilized. The result of 13-24 months post enrollment showed a significant decrease in psychiatric ED visits and shelter days, and statistically significant difference in police transport to the ED.

Individuals enrolled in PWH had higher rates of death than anticipated. Future analysis will look at all enrollees in the study who have died and examine their utilization after enrollment to uncover any

possible predictors for death. Evaluators will also obtain complete data of housing placements for both control and treatment group to measure the PSH treatment effect.

Attachment B provides detailed report of the three year evaluation.

Section III: Rental Assistance Program for the Chronically Homeless (April 1, 2012 through September 30, 2018)

The County's Rental Assistance Program for the Chronically Homeless (RAP CH) is one of several housing resources that collectively make up the pool of rental subsidies available to homeless individuals through the CCP. RAP consists entirely of local (County) funding and currently has an annual budget of $3.5 million for rental assistance payments.

As of March 31, 2018, the monthly subsidy amount ranges from $78 to $3657*, with an average monthly subsidy of $1737 per household. Last quarter, 164 households were provided rental assistance under the RAP CH, including Project Welcome Home and SCVHHS PSH programs. Table A summarizes RAP's participants through September 2018.

(*the Board & Care which is the highest subsidy amount)

RAP CH reached a full capacity during the 2nd quarter of fiscal year (FY) 2016. In order to keep the rental assistance amount within the budget, a collaborative effort has been made to transfer eligible clients to Housing Authority CHDR program. The total amount spent this fiscal year is $861,534, under the budget amount allocated for this period. All eligible households are still being transferred to the Housing Authority CHDR program and PVB units as quickly as possible. The goal is to provide rental assistance to as many households as possible within the annual budget amount.

Table 1

RAP CH ,PWH & SCVHHS PSH	**All Clients**	**Active Head of Households**
Receiving Assistance as of September 30, 2018 including family members	179	164
Moved to Other Permanent Housing including family members	175	
In-Process of Re-Housing	12	12
Deceased	55	
Lease Termination-Closed by CCP Manager including family members	67	
New Clients in Housing Search	48	48
Total Served	**536**	**224**

Section III: Care Coordination Project Performance Measures

The Care Coordination Project (CCP) is a multi-agency initiative to coordinate, prioritize and deliver permanent supportive housing for the County's most vulnerable chronically homeless individuals and families. The County's Office of Supportive Housing (OSH) manages and oversees the CCP and is responsible for assessing the housing needs of chronically homeless persons, prioritizing scarce resources, optimizing funding by strategically allocating resources, leveraging federal resources and monitoring and improving services. Services are also prioritized for vulnerable individuals based on high utilization of healthcare and/or criminal justice services within the county of Santa Clara.

From July 1, 2011 through September 30, 2018, the CCP enrolled 1490 chronic homeless households into intensive case management and housed 1243 households (See Figure 1). The housing retention rate (defined as 12 consecutive months of housing) is 83.6% (Figure 2). This exceeds the CCP's housing retention goal of 80%.

Attachment C provides CCP Outcomes from July 1, 2011 through September 30, 2018.
Attachment D provides Demographic Information for the CCP.

Figure 1: CCP Outcomes

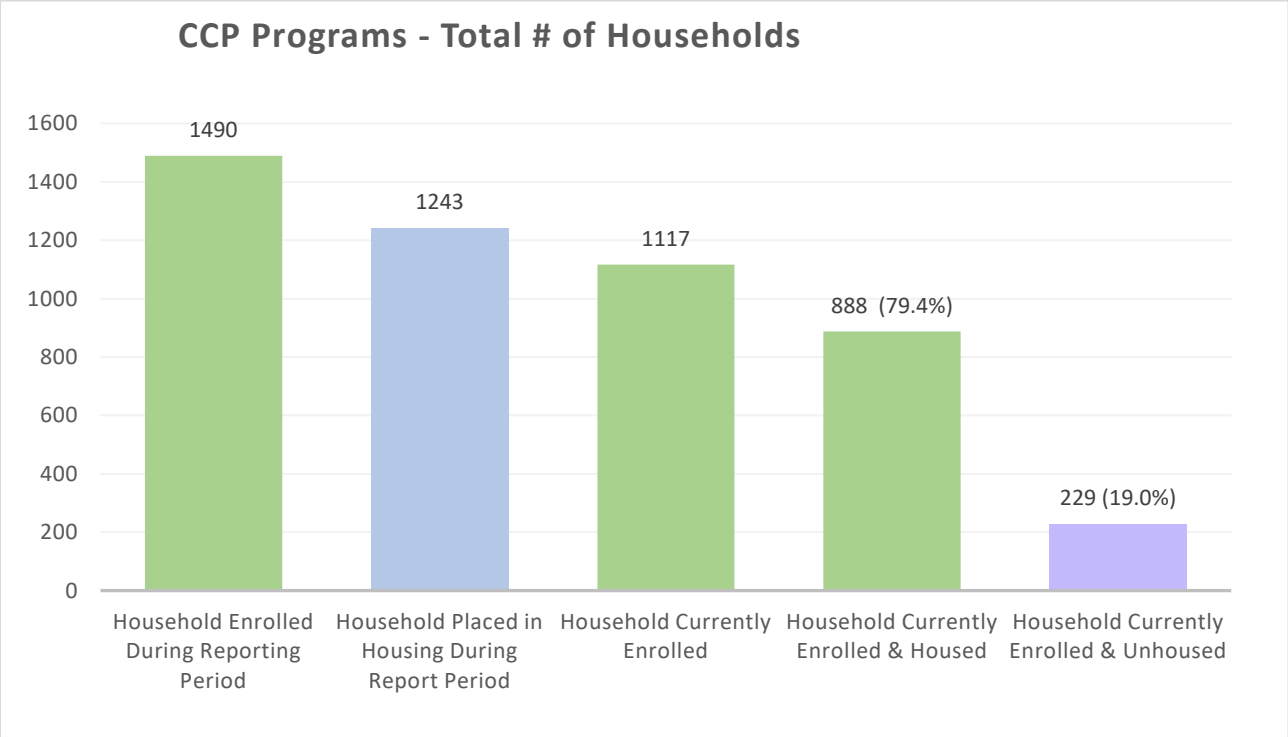


Figure 2: CCP Housing Retention

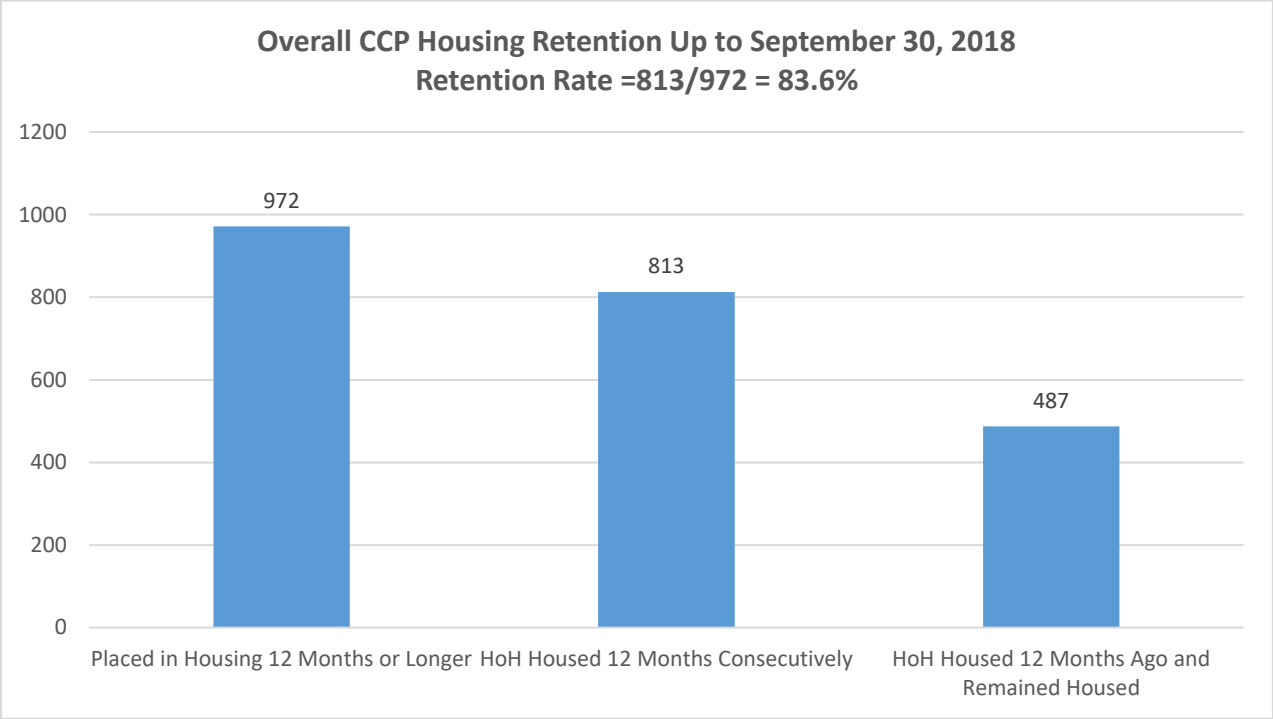


Table 2 and Table 3 show the total capacity for housing subsidies and intensive case management services within the Care Coordination Project as of March 31, 2018.

Table 2: Housing Subsidy Capacity (including PFS)

Funding Source	Total Capacity	In Use
County of Santa Clara	256	221
HUD CoC	495	394
MHSA Housing Program	49	48
HACSC	678	543
Total:	**1478**	**1163**

Table 3: Intensive Case Management (ICM) Capacity

	Total Capacity	In Use
County of Santa Clara	960	960
HUD	15	21 (over allocated)
Veterans Administration	80	60
City of San Jose	180	180
City of Santa Clara	20	20
City of Mountain View	20	20
City of Palo Alto	20	20
Total:	**1295**	**1281**

Section IV: Client Need, System Utilization, and Records Linkage
(July 1, 2011 through September 30, 2018)

The County staff significantly strengthened its ability to:

1) Regularly link CCP clients to their utilization of County health, social service and criminal justice systems; 2) report on changes in system utilization; and 3) estimate costs associated with system utilization and cost avoidance associated with reduced system utilization. The remainder of this report focuses on changes in utilization patterns for CCP clients who receive housing and supportive services. County staff analyzed utilization for 861 unduplicated clients who actively received services from the CCP sometime between July 1, 2011 and September 30, 2018, and remained in housing for one year or more. County staff was then able to link them to service utilization data and other records from the Santa Clara Valley Medical Center, Behavioral Health Services, Social Services Administration and the Criminal Justice Information Control system (CJIC).

Changes in System Utilization. Figures 3 through 12 show the changes in CCP clients' utilization of County services pre- and post-housing. County staff identified an unduplicated list of 861 individuals who were housed by the CCP between July 1, 2011 and September 30, 2018, and who remained housed for a period of one year or more.
The "Pre-Housed" data show the actual utilization of services for those 856 individuals for a period of three years prior to the date each individual was housed. The post-housed data show the actual utilization of services for the same 856 individuals for a period of three years after the date each individual was housed.

Figure 3 shows a downward trend in the utilization of outpatient mental health services by chronically homeless individuals after receiving supportive housing services. There is still a high utilization of outpatient mental health services in the first 12 months post-housing. This is considered positive as clients are encouraged to seek outpatient services and get stabilized. As expected, the utilization decreased significantly after 12 months post-housing. Housing, coupled with supportive case management services provide significant stability to clients who have been homeless for many years. As clients are stably housed longer, the utilization of outpatient mental health services decreased significantly.

Figure 3: Outpatient Mental Health Service Encounters

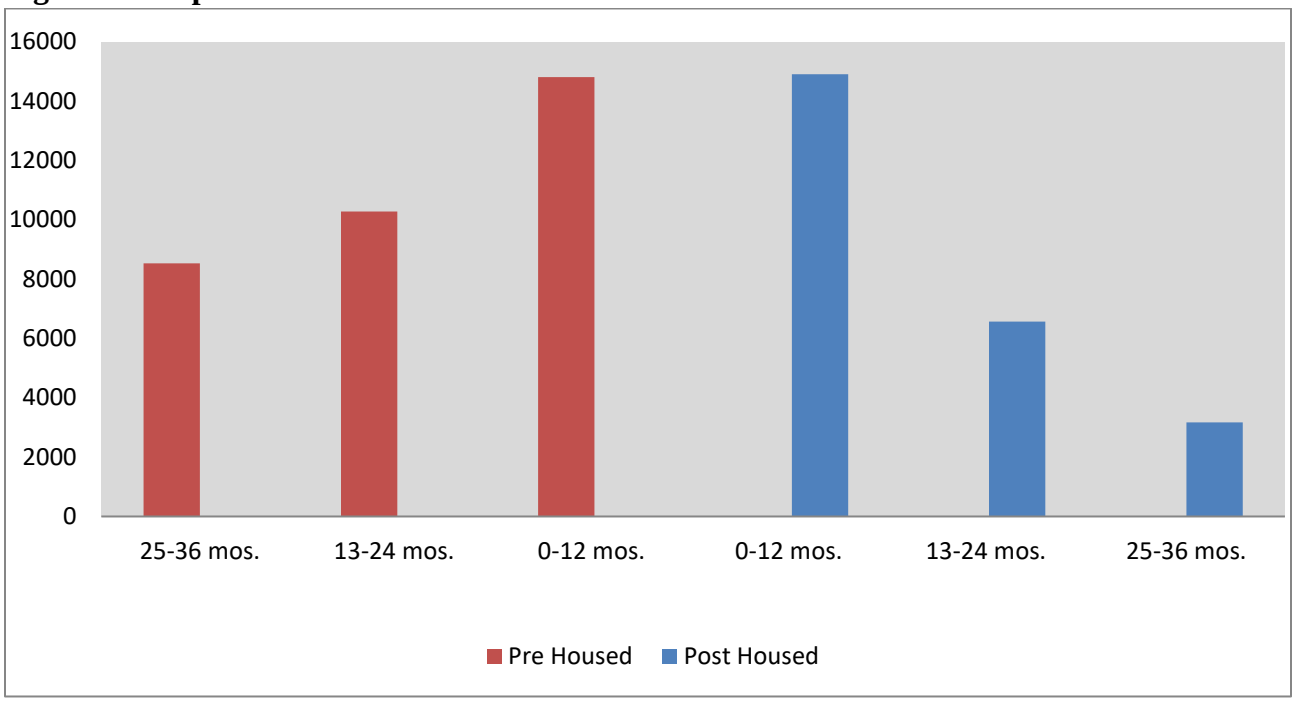


Figure 4 shows a significant drop in utilization of substance use outpatient services post-housing. It's a strong indicator that housing has significantly impacted clients attain sobriety from substance use and decrease utilization of acute/inpatient services.

Figure 4: Outpatient Drug/Alcohol Service Encounters

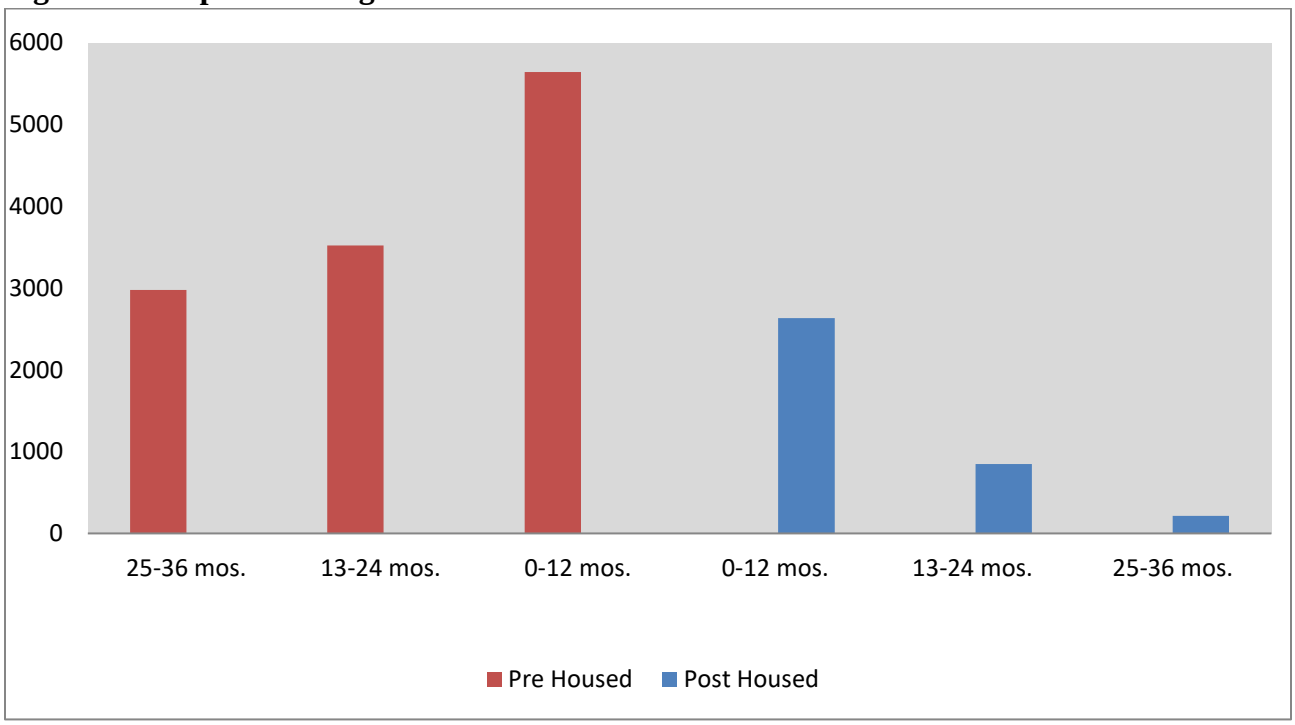


Figure 5 shows a significant reduction of utilization of the Emergency Room after individuals become housed.

Figure 5: SCVMC Emergency Room Admits

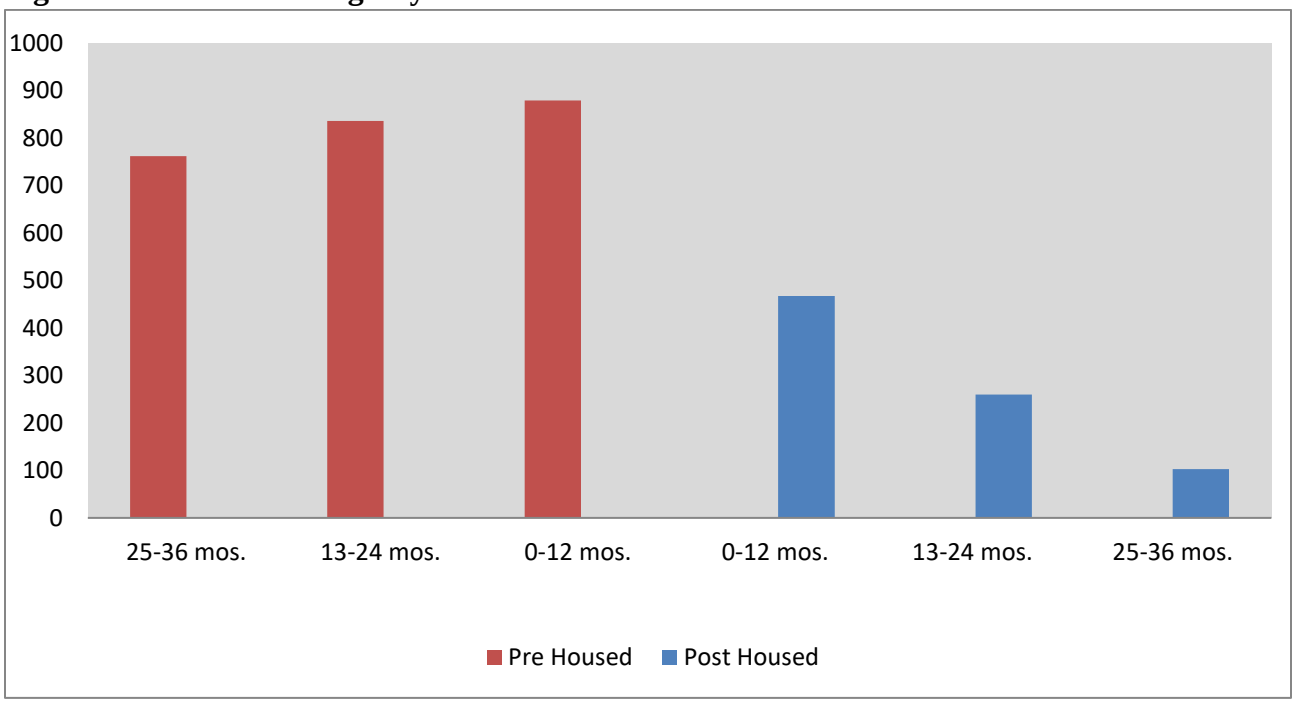
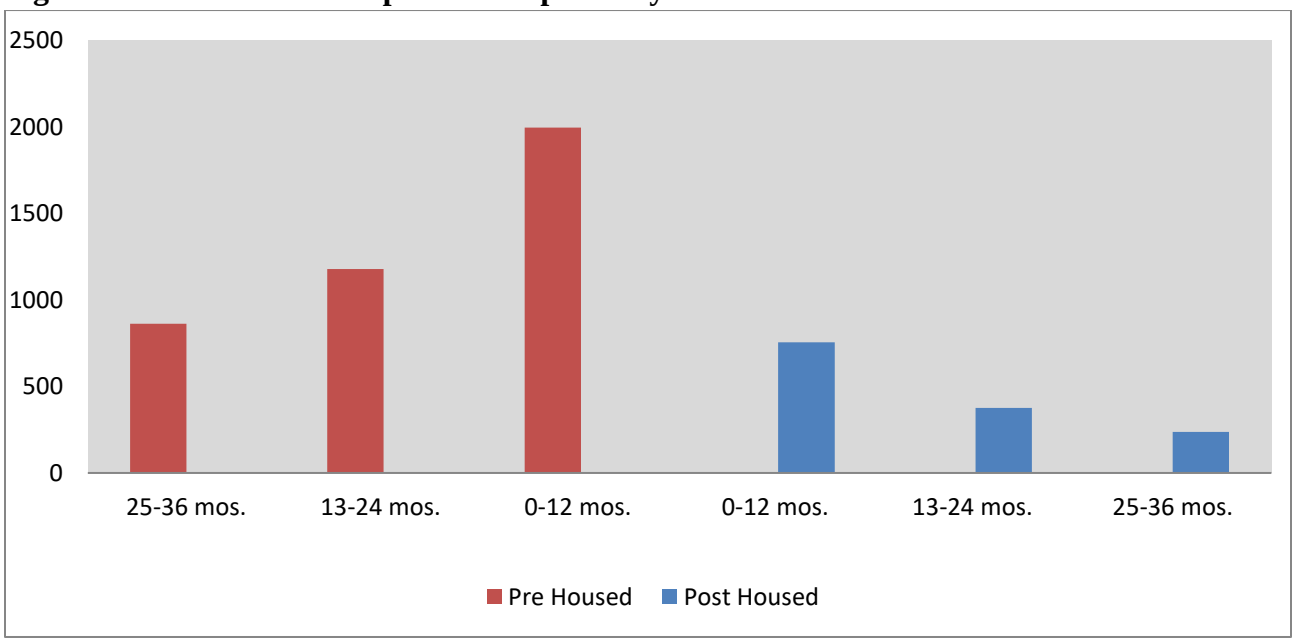


Figure 6 shows a big decline in inpatient hospital days at SCVMC for individuals post housed.

Figure 6: Total SCVMC Inpatient Hospital Days



Figures 7 and 8 show significant decreases in utilization of Emergency Psychiatric Services (EPS) and psychiatric inpatient services post housed.

Figure 7: Total Admits at Emergency Psychiatric Services

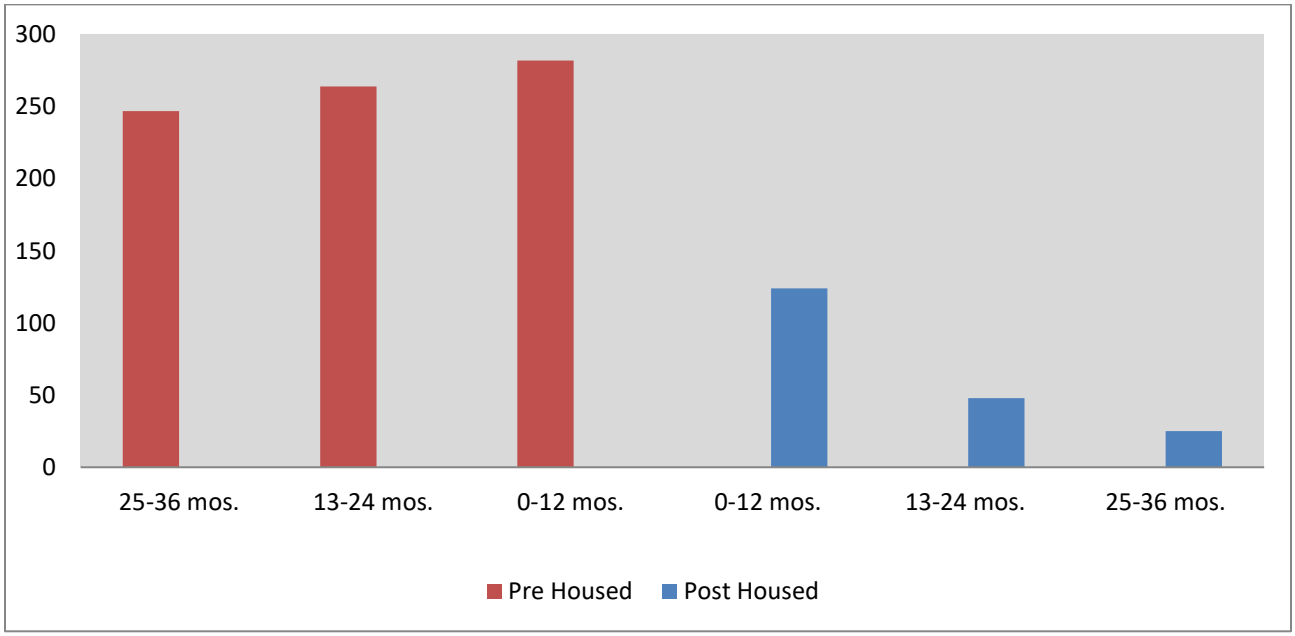


Figure 8: Psychiatric Inpatient Service Days

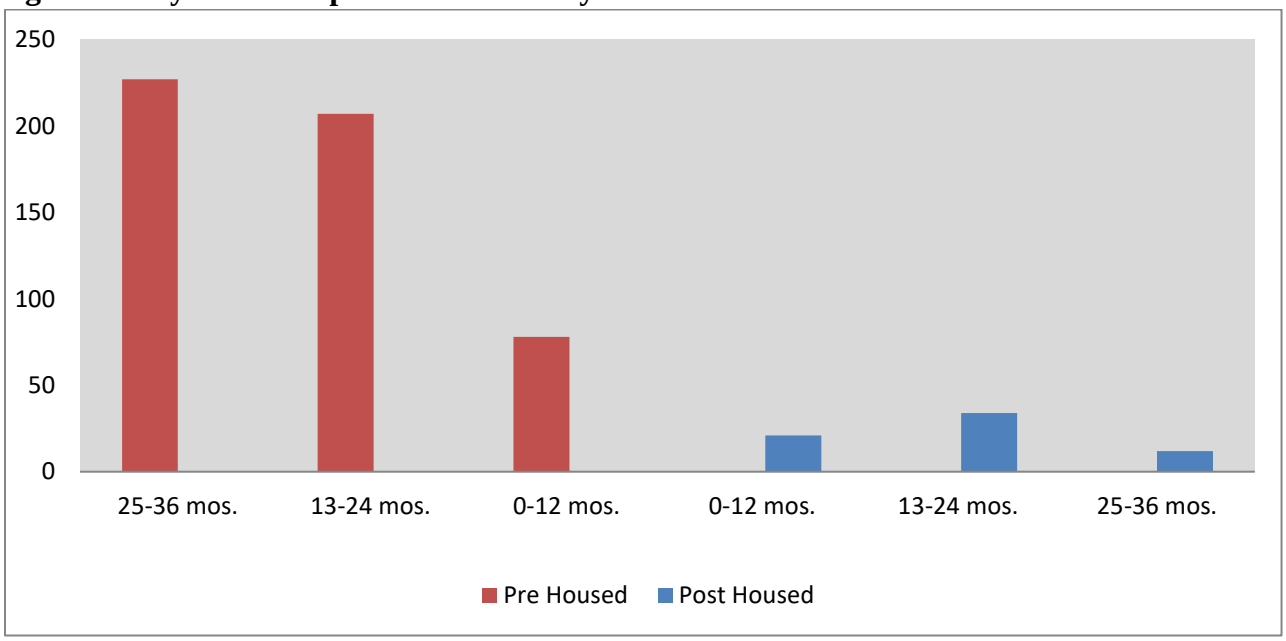
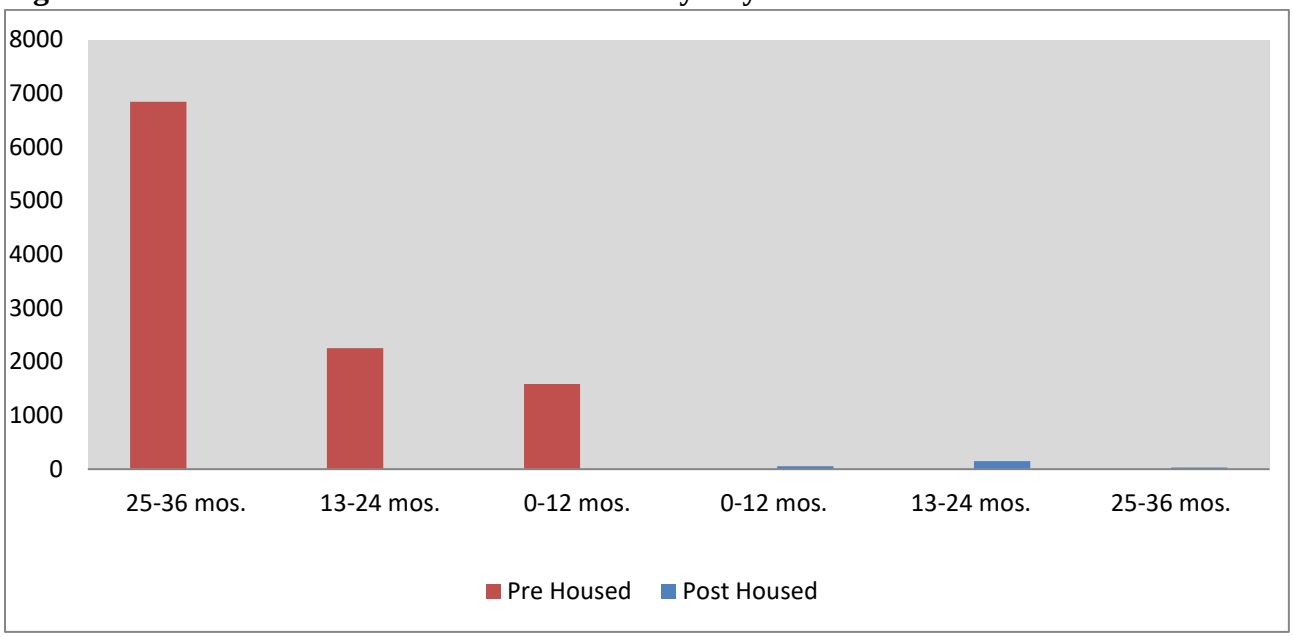


Figure 9 shows a drastic decrease in utilization of mental health Residential Care Facilities (RCF). Note that clients spent *zero* days at RCF 2 years post housing.

Figure 9: Mental health- Residential Care Facility Days



Figures 10 shows a continual decrease in the total number of arrests for individuals after they have been housed.

Figure 10: Number of Arrests

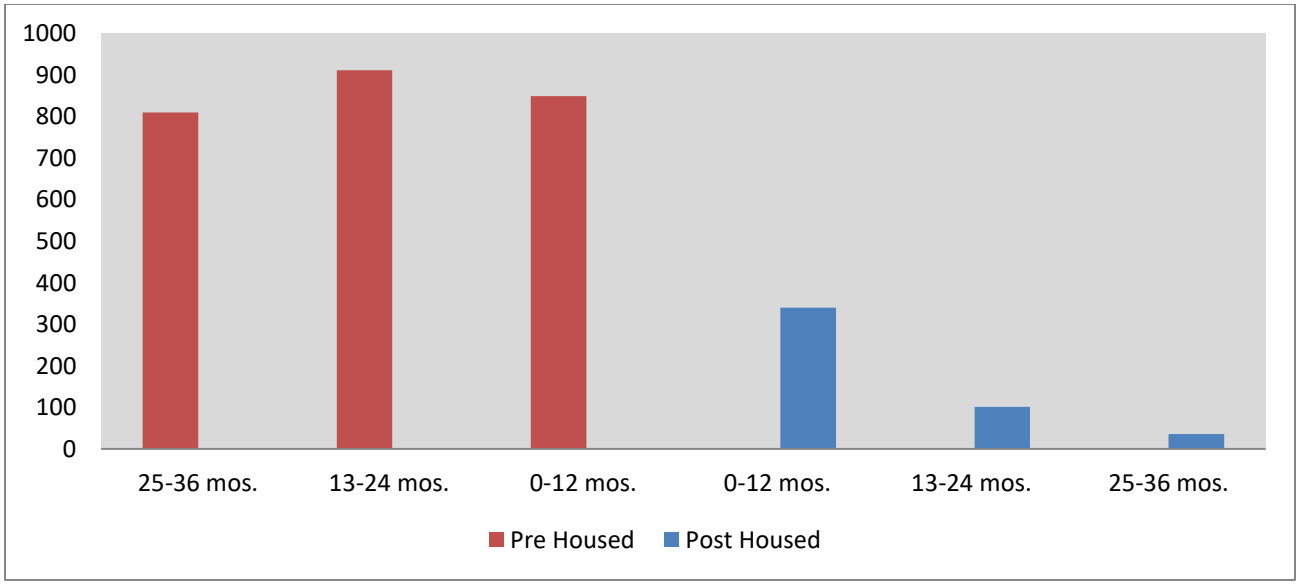


Figure 11 shows a continual decrease in the total number of days incarcerated after being housed.

Figure 11: Total Days Incarcerated

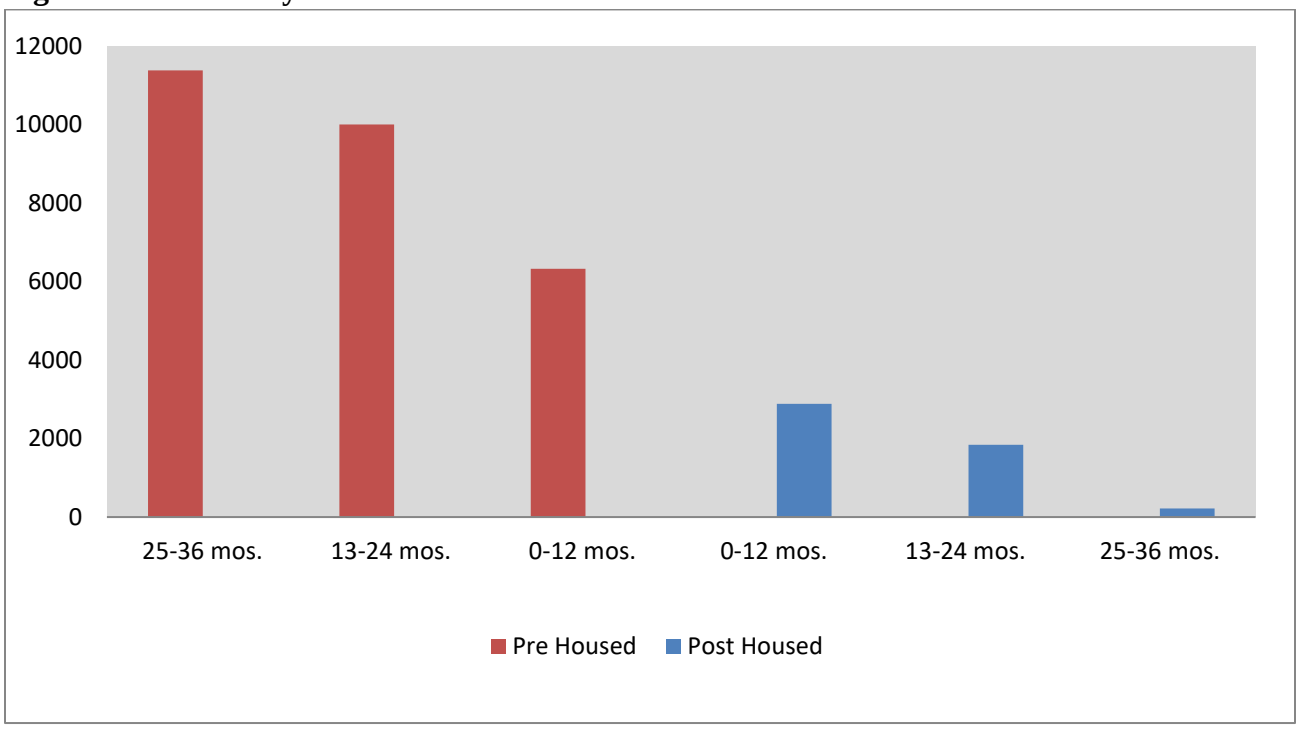
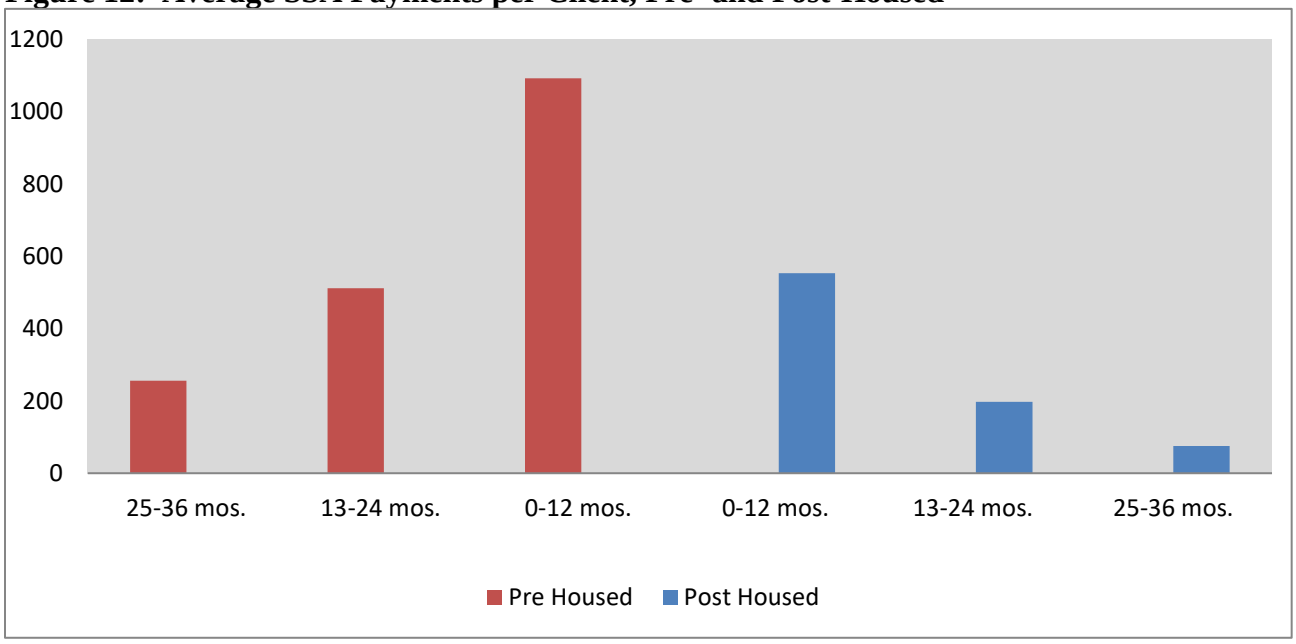


Figure 12 shows that after individuals are housed, there was a significant decline in General Assistance (GA) payments. This may, in part, be due to individuals obtaining the federal disability payments such as Supplemental Security Income (SSI).

Figure 12: Average SSA Payments per Client, Pre- and Post-Housed

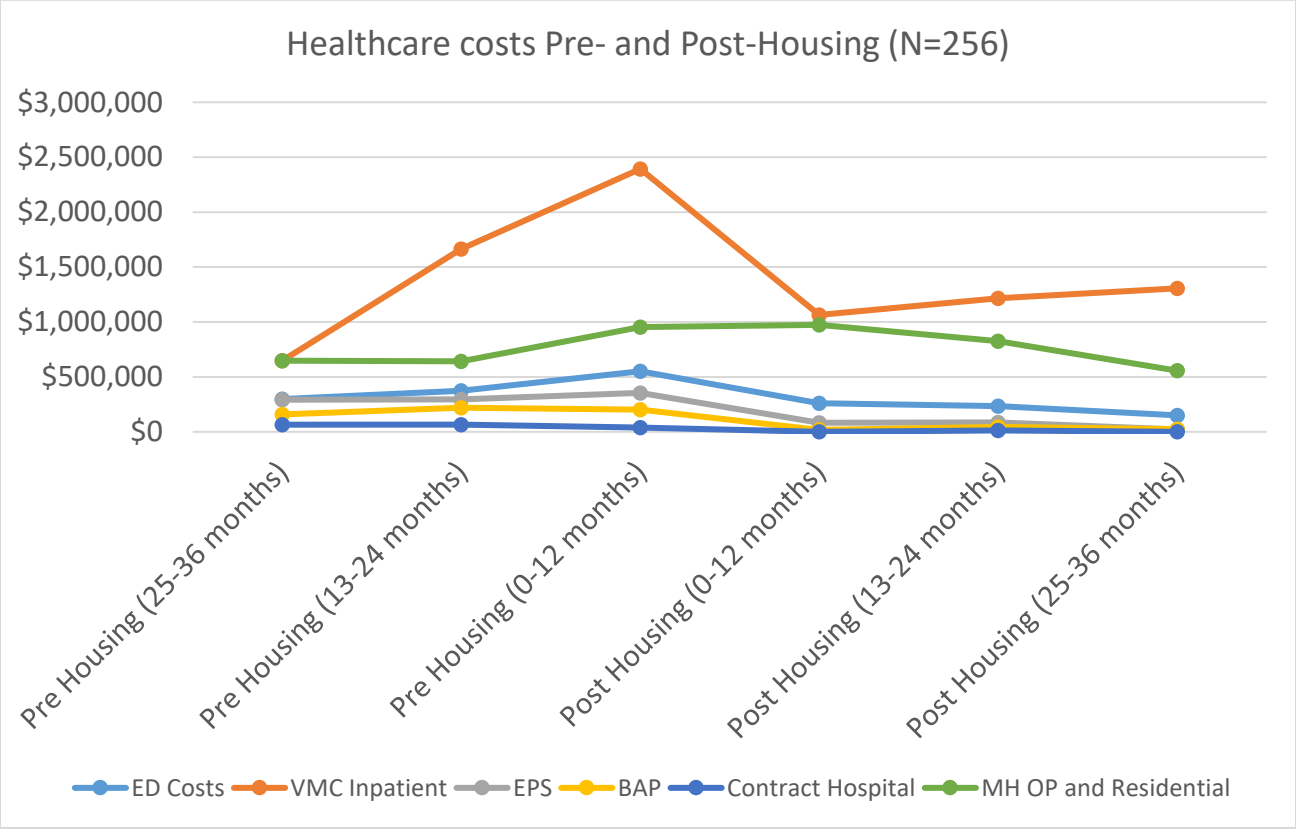


Section V: Cost Analysis for Care Coordination Project (CCP)

County staff completed an analysis of cost avoidance related to healthcare utilization changes for formerly homeless individuals served by the CCP. County staff identified 861 unduplicated individuals who were housed through the CCP sometime between July 1, 2011 and September 30, 2018, and remained in housing for two years or more and accrued costs for healthcare services. For this report, 256 individuals were identified as having been housed for at least two full years and accrued costs for healthcare services.

County staff linked these individuals' information with service utilization and cost data from County Emergency Department (ED), VMC Inpatient, Barbara Aaron Pavilion, Emergency Psychiatric Services (EPS), County Mental Health Outpatient and Residential Programs, and contracted psychiatric hospitals. Pre- and post-housing healthcare costs are shown in Figure 13, below. In total, the healthcare costs for these individuals were approximately $9.8 million for the three-year period pre-housing, and decreased to $6.8 million for the three-year period post-housing, a decrease of over 30%.

Figure 13



Attachment A

Clients Housed	Stable Tenancy	Currently Success	Success Payments
97	3282 months	95 clients	$2,759,103

SUCCESS PAYMENTS SUMMARY

Chart | **Table**

QUARTER	QUARTER PAYMENTS	QUARTER PROJECTION	CUMULATIVE PAYMENTS	CUMULATIVE PROJECTION
1	$4,968	$4,724	$4,968	$4,724
2	$31,050	$24,699	$36,018	$29,423
3	$59,616	$62,440	$95,634	$91,863
4	$126,684	$131,902	$222,318	$223,765
5	$235,566	$259,078	$457,884	$482,844
6	$271,791	$335,578	$729,675	$818,422
7	$333,891	$402,090	$1,063,566	$1,220,512
8	$417,726	$480,147	$1,481,292	$1,700,659
9	$350,244	$325,140	$1,831,536	$2,025,799
10	$325,611	$331,056	$2,157,147	$2,356,855
11	$277,587	$336,337	$2,434,734	$2,693,192
12	$324,369	$336,390	$2,759,103	$3,029,582
13 (in progress)	$297,252	$328,696	$3,056,355	$3,358,277

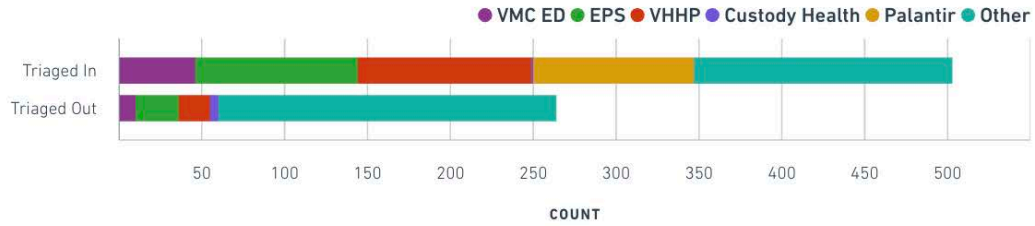
Current Quarter: Jul 01, 2018 - Sep 30, 2018

REFERRAL AND ENROLLMENT

Chart | Table

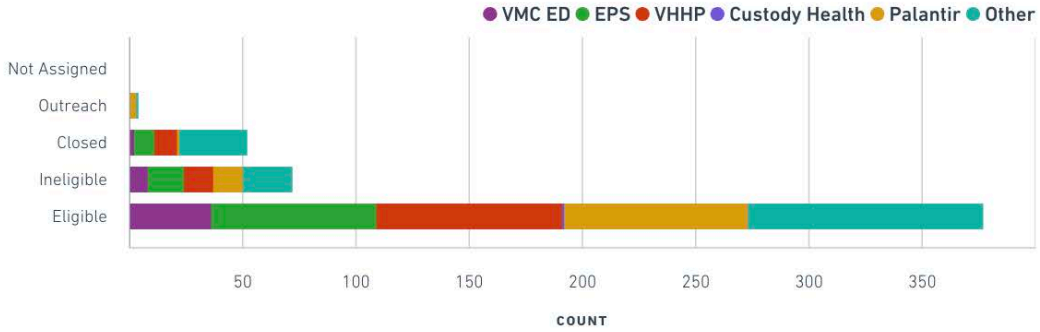
ADMINISTRATIVE SCREENING

Total Triaged	767
Total Triaged In	503
% Triaged In	66%



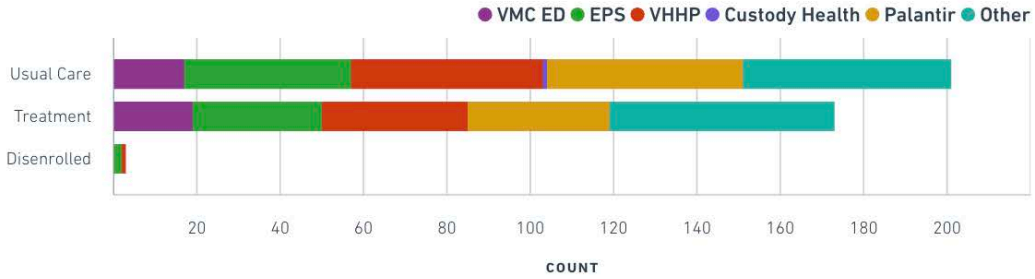
OUTREACH/ELIGIBILITY

Total Outreached	505
Total Eligible	377
% Eligible	75%



EVALUATION ENROLLMENT

Total Evaluation	377
Total Treatment	173



PROJECT WELCOME HOME ENROLLMENT

Last Quarter Cumulative

HOUSING OPERATIONS BREAKDOWN

Document Collection	Housing Search	Currently Housed
9	8	97

Chart | Table

HOUSING RETENTION

PERIOD months

Note: Based on most recent housing placement.

HOUSING UNITS

Chart | Table

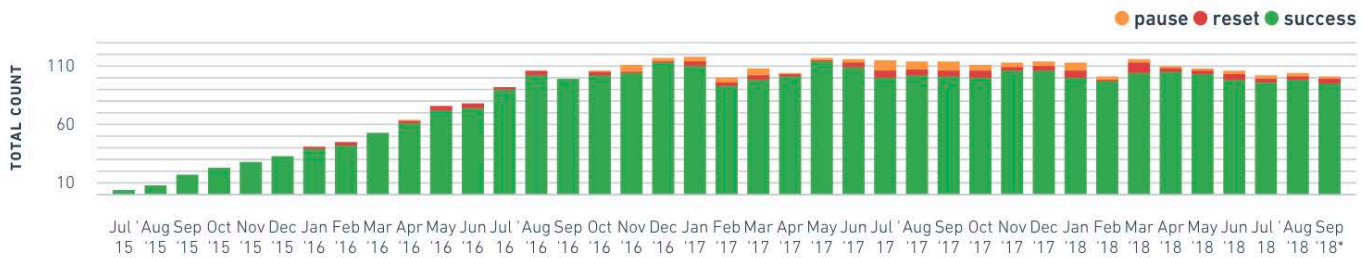
MONTH	CASA DE NOVO	CURTNER STUDIOS	SCATTERED SITE	UNKNOWN	OTHER	ONIZUKA CROSSING	FLEXIBLE HOUSING	DONNER LOFTS	TOTAL
Feb '18	14	29	26	0	3	18	0	17	107
Mar '18	16	26	27	0	4	19	0	16	108
Apr '18	12	27	25	0	5	20	0	16	105
May '18	9	28	27	0	4	20	0	16	104
Jun '18	6	28	25	0	4	20	0	17	100
Jul '18	2	29	25	0	4	21	0	18	99
Aug '18	2	28	25	0	4	20	0	19	98
Sep '18*	2	28	24	0	4	20	0	19	97

*Indicates month in progress.

SUCCESS MEASUREMENT

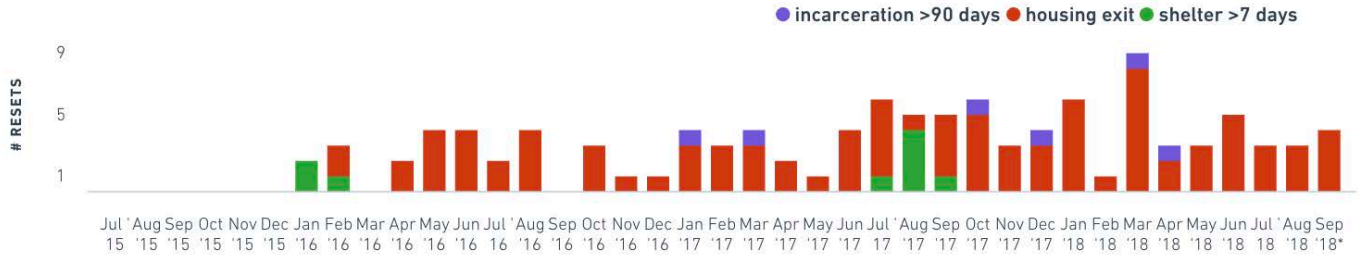
Currently Success	Currently Paused	Currently Reset
95	2	14

Chart | Table



PAUSES REASONS

RESET REASONS

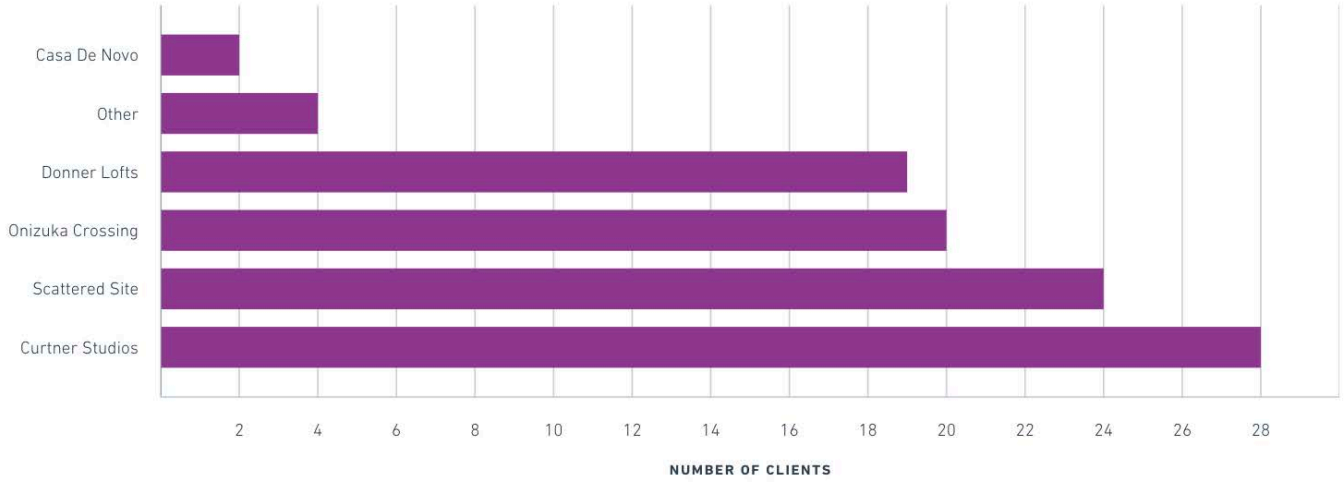


*Indicates month in progress.

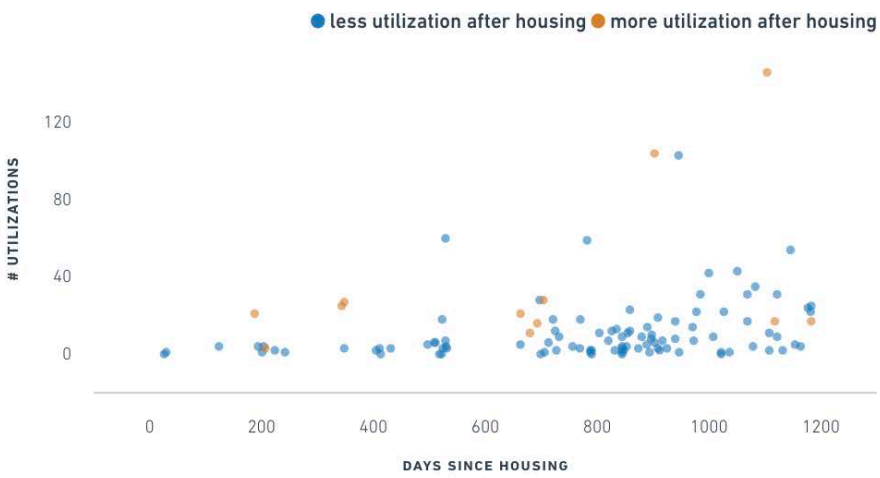
Note: Data sorted by housing month completed; for resets over multiple periods, resets are indicated at initial time of reset (not ongoing)

HOUSED | **PROJECT TO DATE (BY ENROLLMENT)** | THIS QUARTER (BY ENROLLMENT) | LAST QUARTER (BY ENROLLMENT) | THIS MONTH (BY ENROLLMENT)

Case Manager | **Housing Type**



Utilization After Housing | Utilization Over Time

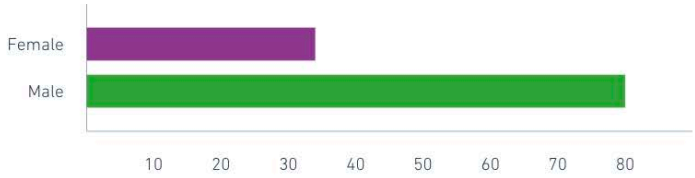


FILTER SERVICES Clear all services

VMC 2REHAB ✕ VMC 3SURG ✕ VMC 4MED ✕
VMC 4SURG ✕ VMC BAP400 ✕ VMC BAP500 ✕
VMC CCU ✕ VMC ED ✕ VMC EPS ✕
VMC MICC ✕ VMC MICU ✕ VMC MSSU ✕
VMC TCNU ✕ VMC TICU ✕ VSC PFL ✕
[BRC Nightly New Start] ES Housing ✕
[BRC Nightly Shelter] ES Housing ✕
[Emmanuel House (Overnighter)] ES Housing ✕
[LifeMoves-MSI-Pre-transitional] ES Housing ✕
[Nightly CWSP Gilroy] ES Housing ✕
[Nightly CWSP Sunnyvale] ES Housing ✕
[VHHP Medical Respite Center] ES Housing ✕

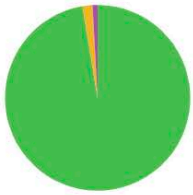
Demographics | Age | Diagnoses | Education

GENDER



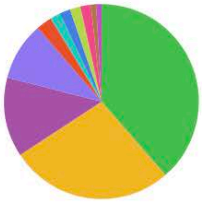
LANGUAGE

- English (111)
- Spanish (2)
- Tagalog (1)



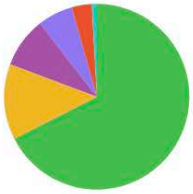
ETHNICITY

- White or Caucasion...
- White or Caucasian...
- Black or African Am...
- Hispanic or Latino (...
- Other (3)
- Pacific Islander (2)
- Asian (2)

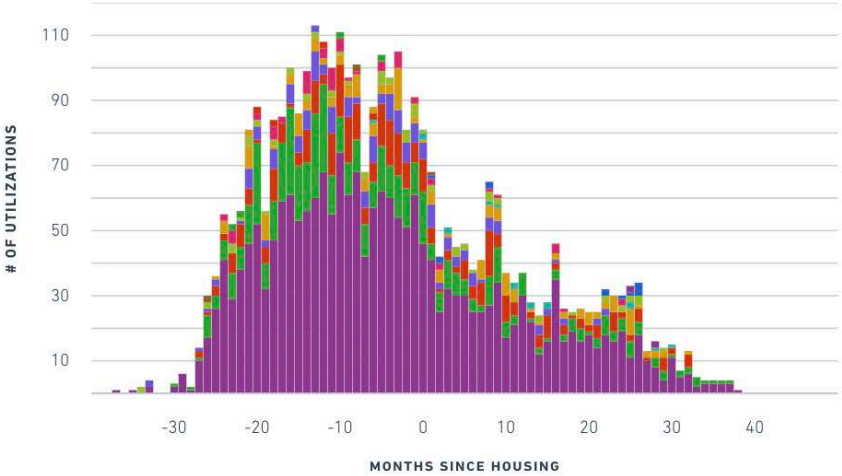


MARITAL STATUS

- Single (77)
- Divorced (15)
- Married (10)
- Legally Separated...
- Widowed (4)
- Significant Other (1)



Services Pre/Post Housing | Top Services Breakdown



- VMC TICU
- ZZVMC3R...
- VMC BAP...
- VMC BAP...
- VMC 2A...
- VMC MICC
- VMC 5A...
- ZZVMCTC...
- VMC 4SU...
- VMC 6A...
- VMC 2 MED
- ZZVMC4...
- VMC 3SU...
- VMC EPS
- VMC ED

PERIOD

months

FILTER SERVICES Clear all services

VMC 2 MED ✕ VMC 2A MICU ✕ VMC 3SURG ✕ VMC 4SURG ✕ VMC 5A PCU ✕ VMC 6A MED ✕ VMC BAP400 ✕ VMC BAP500 ✕ VMC ED ✕ VMC EPS ✕ VMC MICC ✕ VMC TICU ✕ ZZVMC3RHB ✕ ZZVMC4MED ✕ ZZVMCTCNU ✕

Attachment B

Santa Clara County Pay For Success
Project Welcome Home

3-year report

November 1, 2018

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Margot Kushel, MD; Professor, Div. of General Internal Medicine, UCSF
Matthew Niedzwiecki, PhD; Assistant Professor, Dept. of Emergency Medicine, UCSF; Health Researcher, Mathematica Policy Research
Sarah Sabbagh, MPH; Health Policy Research Associate, Dept. of Emergency Medicine, UCSF

I. INTRODUCTION

Santa Clara County is home to the sixth largest population of people experiencing homelessness in the country,[i] with nearly 7,400 homeless individuals reported in 2017.[ii] Systemic factors that contribute to high rates of homelessness in Santa Clara County include a high cost of living and a real estate market that renders construction of affordable housing challenging. Homeless individuals, particularly those who are chronically homeless, have multiple health challenges, including chronic diseases, substance use problems, and mental health conditions. This results in frequent use of multiple acute, emergent, and behavioral health services, such as emergency department (ED) visits, hospitalizations, mental health and substance use treatments, and jails.

Providing low-barrier permanent housing, or subsidized housing that does not require commitments to sobriety or engagement in care, has been shown to house chronically homeless people effectively. Low-barrier subsidized housing with on-site or closely linked voluntary supportive services (such as case management, medical, mental health, and substance use treatment) known as permanent supportive housing,[iii] – has become a primary strategy for housing chronically homeless individuals. A growing literature highlights the ability of permanent supportive housing to create cost offsets by housing chronically homeless individuals whose needs result in high costs to the health and social care delivery systems. For example, one study found that supportive housing resulted in reductions in shelter use, hospitalizations, length of hospital stay, and time incarcerated among homeless people with severe mental illness.[iv] Another study found that the use of permanent supportive housing led to decreases in emergency and inpatient hospital services.[v] However, this literature has been marred by low quality research, which compares use before and after housing, and doesn't take into account regressions to the mean and selection bias. Further, access to permanent supportive housing remains limited due to the associated costs and scarcity of available housing units, and more rigorous evaluation of its impact is needed.

We are now in the fourth year of Santa Clara County's Pay for Success project entitled Project Welcome Home (PWH). PWH aims to evaluate the provision of permanent supportive housing for chronically homeless individuals who are frequent users of health and mental health care systems and jails in Santa Clara County. The success outcome for PWH is stable tenancy for individuals placed in permanent supportive housing. We have also undertaken a randomized controlled trial (RCT) that is examining differences in utilization of health services and the criminal justice system, and monitoring the changes in use of longitudinal care (e.g. regular attendance at primary care). Our RCT compares the outcomes for chronically homeless individuals with high utilization of multiple County services (acute medical, mental health, and jail) who receive permanent supportive housing (intervention) to those who are randomized to receive usual care (control).

This report documents the analysis of PWH data through the first three years of the project and presents findings on months of continuous stable tenancy, primary care utilization, ED visits, inpatient medical hospital care, utilization of mental health and substance use services, criminal justice system use, and ambulance use. We hypothesize that individuals receiving the PWH

intervention of immediate referral to PSH administered by Abode Services will experience a decrease in the utilization of acute, emergent, and criminal justice services over time (e.g. ED visits, inpatient hospitalizations, use of ambulance services, inpatient psychiatric stays, and jail stays), along with an increase in other more sustaining health services associated with improved health and social outcomes (e.g. primary care chronic disease management, outpatient primary care, and outpatient mental health and substance use services).

II. METHODS

RCT framework: Our RCT employs an intention to treat (ITT) framework, which means that all patients randomly assigned to one of the treatments are analyzed together, regardless of whether or not they completed or received that treatment. In this case, individuals who are randomized to the permanent supportive housing intervention will be retained in the intervention group for our analysis even if they are not able to be located, if they are located but never enter housing, or are located, engaged, and enter housing, but are not retained in housing long-term. We follow individuals randomized to the usual care group administratively using data provided by the County in the Palantir platform in order to track study outcomes in comparison to those in the intervention group. This is the most rigorous method to assess results, because it maintains the original randomization scheme. The findings are not subject to the bias introduced if we "break" randomization. This method tends to offer conservative estimates of effect.

Recruitment: Individuals are screened for eligibility by County staff use a screening tool developed for this study that uses administrative data on medical and behavioral health conditions, length of homelessness, and health and social services utilization history. The tool identifies residents of Santa Clara County who are chronically homeless frequent users of acute County services and are predicted to remain frequent users in the future. County staff at County facility/referral points (i.e., Valley Medical Center (VMC), Emergency Psychiatric Services (EPS), Valley Homeless HealthCare Program (VHHP), Custody Health / Re-Entry Center) can identify potential participants in real-time and refer them to trained study staff for further evaluation of eligibility to enroll. After assessing individuals' eligibility based on the screening tool, trained study staff arranges to meet potential participants in person and verify eligibility. To be eligible for consent and enrollment, an individual must be chronically homeless as determined by the County, live in Santa Clara County, and meet a pre-determined threshold of a combination of emergency department visits, hospital admissions, psychiatric emergency department visits, psychiatric hospitalizations, and county jail days. Individuals are ineligible for consent and enrollment if they are: incarcerated; connected to and choose not to leave another Specialty Mental Health or other intensive case management program (because Abode is considered an intensive case management program); hospitalized and the treating physician(s) plans to discharge them to a skilled nursing facility or inpatient hospice; or unable to give informed consent as determined by inability to complete teach-back (see below).

Eligible individuals consented using the teach-back method to assure understanding of the study.[vi] They are then randomized to either the intervention or control group using a

computerized random number generator that sends an automatic email to study staff indicating assignment. Individuals randomized to the intervention are handed-off to Abode for outreach and engagement in the permanent supportive housing intervention program.

After the initial consent and randomization, individuals who consent to be in the study are not contacted for the purposes of this evaluation. Individuals randomized to the control group (usual care) may be offered housing via other County-based channels, per usual care.

Data sources: Our evaluation team uses the Palantir data platform to extract and analyze data from multiple county data sources. Palantir developed a platform that pulls and matches data from HealthLink (all physical health services within the Santa Clara County system, including ambulatory care, Emergency Department and inpatient hospitalizations), CJIC (County jail systems), HMIS (Santa Clara County homeless information), and both Unicare and DADS, the County mental health and substance use treatment data systems. These data are pulled hourly and accessible through encrypted, password-protected sites accessible only to study staff. Our evaluation team is the only group who has access to CJIC data (for all clients) and data for individuals randomized to the control group. We are working with the County to gather data on housing placements for individuals in the control group as well as individuals randomized to the intervention group who were never placed in housing.

At three years, the study sample is large enough sample to examine results at 24 months post enrollment. We do not present results for the period of 12 months post enrollment because this shorter follow-up period will be dominated by the time that it takes to house individuals after they are enrolled. We would not expect to find effects within this short follow-up period. In addition, because behavior change regarding the use of health services can be a long process of engagement and trust-building, we examine results for the period starting 12 months after enrollment for all participants enrolled for at least 24 months (13-24 months post-enrollment).

Analysis

To evaluate the randomization, we compared the mean characteristics (e.g., demographics and pre-enrollment utilization) of the intervention and control groups using chi-square and t-tests. To evaluate the causal effect assignment to the treatment group using an intent-to-treat framework, we compared the mean outcomes of all individuals assigned to the treatment group to those individuals assigned to the control group. Outcomes included health services use (e.g., emergency department, other hospital services, outpatient behavioral health care), other social services use (shelter and single room occupancy (SRO) housing), and criminal justice encounters (arrests and time spent in county jail). In additional analyses, we used negative binomial regression models to incorporate additional control variables. We chose negative binomial models to account for the fact that the outcome variables were counts of service utilization over a certain time period and were not normally distributed. We compare outcomes at $\alpha = 0.95$ with two-tailed tests. We analyze two time periods: (1) a 24-month period after enrollment and (2) a 12-month period that began one year after enrollment (enrolled months 13 through 24). By excluding the first year of enrollment, we aimed to isolate medium-term outcomes that may emerge after individuals were housed for several months.

We only include individuals who have evidence of remaining in the County or who are alive at the start of our analysis period and who are "present" in the data (no evidence of death or moving out of county) for at least half of the analytic period. We define attrition as not having any utilization in any sector for a 6+ month period that extends through the end of the study period but having no record of death. We assume that people with no contact in County-based services for six months have moved out of county. For those who have died and who have evidence of attrition, we censor their data after their last receipt of service. Specifically, we prorate their utilization for the study period, based on their utilization when they were present in the data. For example, in the 0-24 month analysis, we include only individuals with at least 12 months of the data. For an individual who died or have evidence of leaving the county moved out of county in month 16, we prorate their utilization in the first 15 months and apply it to the final months of the analytic period. Suspected deaths are confirmed with data from Abode Services and County death records.

Because the rate of death for participants enrolled in the evaluation was higher than expected in both groups, we also compared pre-enrollment data between individuals who died and those who remain alive to explore whether demographic characteristics or patterns of health and social services utilization differed prior to study enrollment and randomization.

III. RESULTS

Study Enrollment:

Cumulatively by the end of Q12, 499 of the 763 individuals who screened as potentially eligible based on our UCSF triage tool had undergone assignment to study staff and outreach. A total of 372/499 (74.5%) of these individuals were found to be eligible based on further assessment by study staff during the reporting period. By the end of the reporting period, 372 individuals were randomized and enrolled in the study (199 to usual care and 173 to the PWH intervention). The other 264 did not meet enrollment criteria. The primary reasons that led to ineligibility include the client already being housed; preferring to stay with their current case manager rather than enroll in PWH; being too cognitively impaired to give consent; not meeting the chronically homeless definition; requiring a higher level of care; no longer living in the County; passing away; or refusing services.

Program Exits/Non-Conforming Referrals:

Sixty-five (65) individuals who were randomized to the treatment group and referred to Abode were categorized as non-conforming referrals and were exited from the program or died. These individuals remain in the analysis as members of the intervention group, even though Abode did not offer them services. Reasons for being declared non-conforming include: death between the time of randomization and housing (23); unable to contact after randomization despite significant efforts by Abode (17); declined Abode's services despite having consented to study enrollment (3); required hospice or nursing facility placement (3); requested to disenroll from the program (3); left county (3); violence towards staff and asked to leave program (2);

other reasons, such as long term incarceration (13). Two individuals were eventually eligible and enrolled in the control group.

As expected, many of the PWH enrollees did not remain in their first housing placement, or in some cases in subsequent housing placements. Among the clients enrolled in the program the end of the quarter, 66% had been re-housed once; 24% had been re-housed two or three times; and 10% had been rehoused 5-9 times. The program staff estimates that, at any point in time, there are approximately 10% of enrollees who are unhoused and in housing search after initial placement.

Deaths and Attrition (See Appendix 1)

In the control group, we confirmed that 18 individuals who were not present in any of our datasets for 6 or more months had died based on records from Santa Clara County. An additional 20 had no record of death and we therefore assume they have moved out of the County. In the treatment group, we found that 23 individuals had died based on reporting from Abode and Santa Clara County, whereas only 7 individuals that were not present in the data had no death record, and were presumed to have moved out of the county. We present data examining differences in individuals who died and remain alive (regardless of what group they are assigned to for the evaluation) on page 7 and in Appendix 4.

RCT FINDINGS (see Appendix 2)

We present data from the randomized control trial, along with narrative explanations. Our **main results** consist of analyses that censor individuals who died or experienced attrition (moved out of County) (see Appendix 1, Table 1), and include all other participants, as well as regression results that control for small observable differences among the treatment and control groups after randomization.

This intention to treat analysis that includes all participants randomized to either treatment or control groups, regardless of whether individuals randomized to the treatment were ever able to be contacted by Abode and/or housed.

<u>Baseline data prior to enrollment:</u> Demographics and pre-enrollment utilization is balanced across treatment and control groups, as would be expected in a randomized controlled trial. As expected, with many variables, they differed in one variable. Individuals randomized to the treatment group were 14.9 percentage points ($p<0.01$) less likely to have reported a usual source of care (doctor or nurse practitioner) in the two years prior to enrollment. (Appendix 2, Table 1)

<u>Twenty-four months post enrollment with censoring for death and attrition</u> (n=122 usual care, n=108 treatment)

Table 2 in Appendix 2 displays data for the 24-month period post enrollment for all individuals enrolled in the evaluation, censoring those who attrited or died. We see statistically significant

decreases in the number of psychiatric ED visits (4.9 control vs. 2.9 treatment, p=0.03) and the number of ED visits that occur via police transport (1.4 control vs. 0.7 treatment, p=0.01). We continue to see non-statistically significant reductions in ED visits (15.7 control vs. 13.1 treatment), inpatient hospital visits (3.9 control vs. 3.1 treatment) and shelter days (32.4 control vs. 18.2 treatment) comparing control and treatment groups. We also see statistically significant differences in outpatient mental health services use, with a greater number of visits in the treatment group across multiple categories (43.6 control vs. 83.8 treatment, p<0.01 for any mental health visits). Differences in outpatient substance use treatment are not statistically different between the two groups.

13-24 months post enrollment with censoring for death and attrition (n=116 usual care, n=100 treatment)

Table 3 in Appendix 2 displays data for the 12-month period starting one year after a participant was enrolled, censoring for those who attrited or died. We look at these data because based on existing literature and our discussions with Abode's direct services staff, it is clear that it can take several months for individuals to become stably housed, and then begin to shift health-seeking behaviors. The time frame one year after enrollment allows us to examine for differences after this first year has occurred. Here, we see statistically significant differences in psychiatric ED visits (2.3 control vs. 1.1 treatment, p=0.01) and shelter days (13.6 control vs. 3.5 treatment, p=0.01), and statistically significant differences in police transport to the ED (0.7 control vs. 0.3 treatment, p=0.01). We continue to see non-statistically significant trends towards fewer ED visits and inpatient hospital admissions. We continue to see more use of mental health rehabilitation services and (to a lesser degree), and fewer substance use services visits in the treatment group but these results are not statistically significant.

NEGATIVE BINOMIAL REGRESSION MODELS (see Appendix 3)

Appendix 3, Table 1: 24 months post-enrollment

Table 1 shows results of our model at 24 months, for individuals enrolled in the evaluation for at least 24 months' time. This model includes all individuals enrolled in the evaluation regardless of their receipt of housing.

Treatment group findings (Table 1, Column 1)

In our regression model, we find that overall, for those who had been enrolled in the evaluation for at least 2 years, at 24 months those in the treatment group had statistically significantly lower rates of shelter use (IRR 0.63; 95% CI [0.39, 1.00] for shelter stays; IRR 0.55; 95% CI [0.35, 0.87] for shelter days – p<0.05 for both) and statistically significantly higher rates of outpatient mental health services use (IRR 2.60; 95% CI [1.77, 3.80] – p<0.01). In addition, those in the treatment group were more likely--at the 0.10 level of significance-- to have lower rates of non-psychiatric hospital admissions (IRR 0.70; 95% CI [0.46,1.06]), lower rates of combined medical and psychiatric hospital admissions (IRR 0.67; 95% CI [0.43,1.04]), and lower rates of ED visits that result in hospital admissions (IRR 0.68; 95% CI [0.44,1.06]).

Other findings (Table 1, additional columns)

The remainder of Table 1 examines the rate of outcomes for specific participant characteristics, regardless of their assignment to the treatment or control group. These findings may be helpful to guide staff and programs that interface with similar populations by pointing to specific demographic groups/characteristics associated health and social services use. As an example, men enrolled in the evaluation (regardless of assignment to the treatment or control group) had statistically significantly lower rates of psychiatric hospital admissions (IRR 0.11; 95% CI [0.02,0.52], p<0.01), higher rates of non-psychiatric hospital admissions (IRR 1.58; 95% CI [1.05,2.37], p<0.05), and higher rates of arrests (IRR 1.76; 95% CI [1.07,2.89], p<0.05). Those enrolled in the evaluation who identify as Latinx have statistically significantly lower rates of total hospital admissions (IRR 0.57; 95% CI [0.33,0.98], p<0.05) and ED visits (IRR 0.70; 95% CI [0.50,0.96], p<0.05).

Appendix 3, Table 2: 13-24 months post-enrollment

Table 2 shows results of our model from 13-24 months post-enrollment, for individuals enrolled in the evaluation for at least 24 months. As mentioned previously, we are exploring the period 1-year after enrollment because behavior change regarding the use of health services can be a long process of engagement and trust-building: being placed in a stable housing environment and accompanying behavior change may not occur until several months to a year after enrollment.

Treatment group findings (Table 1, Column 1)

Examining the 12-month time period starting one year after enrollment, we find that overall, those in the treatment group had statistically significantly lower rates of police transport to the ED (IRR 0.43; 95% CI [0.24, 0.77], p<0.01), shelter use (IRR 0.11; 95% CI [0.05, 0.24] for shelter stays; IRR 0.10; 95% CI [0.05, 0.23] for shelter days, p<0.01 for both), and substance use treatment visits (IRR 0.38; 95% CI [0.18, 0.84], p<0.05), and higher rates of outpatient mental health services use (IRR 1.91; 95% CI [1.20,3.04], p<0.01). Again, while not statistically significant at the 0.05 level, we see, at the 0.10 level of significance, lower rates of combined inpatient and psychiatric hospital admissions (IRR 0.64; 95% CI [0.38,1.08]).

DEATH DATA (see Appendix 4)

We compared the pre-enrollment demographics and utilization data between participants who died and participants who are still alive regardless of the group to which they were randomized. (Appendix 4, Table 1). Individuals who died were more likely to be male (82.9% died vs. 71.1% alive, p=0.11), older (54.5 years died vs. 50.2 years alive, p=0.02), have inpatient admissions (4.6 died vs. 2.4 alive, p<0.01), have ED visits delivered by ambulance (8.2 died vs. 5.6 alive, p=0.08), and DADS (substance use services) crisis visits (0.3 died vs. 0.1 alive, p=0.03). Those who died were less likely to have police transports to the ED (0.4 died vs. 1.5 alive, p=0.05). We plan to explore these findings in more depth (*see Future Analyses*, below).

IV. DISCUSSION

The Santa Clara County Pay for Success Project Welcome Home evaluation has entered its fourth year. Our evaluation is unique in that it focuses on a subset of chronically homeless individuals who are the most frequent users of the county's services. It also presents an opportunity to advance the research about the effectiveness of permanent supportive housing (PSH), and by doing so, inform future initiatives to address chronic homelessness in Santa Clara County and elsewhere. The study will also fit in a growing body of literature that uses randomized controlled trials to examine outcomes of the provision of permanent supportive housing services.[vii,viii,ix,x] The findings from this study could be used to inform policy and programmatic decisions for all governmental and non-governmental entities that provide services for the homeless.

This 3-year report, which summarizes our results to date, is encouraging. Ours is the first RCT we are aware of to focus on the impact of permanent supportive housing for frequent users of acute county health and social services. We are encouraged by our findings to date.

We selected individuals for participation in Project Welcome Home because they were the most complicated, with multiple indications of mental health, substance use and physical health problems, as well as prolonged homelessness. Their success at housing and our consistent finding of statistically significant reductions in use of shelter stays contradicts the narrative that individuals prefer homelessness to housing.

Our study has a relatively small sample size, which limits our power to detect subtle differences in our outcomes between participants who are randomized to the treatment and control groups. However, we are seeing multiple statistically significant differences between these groups in areas of importance for policy makers and providers including decreased use of shelter and decreases in police transport to the ED. We also see multiple other encouraging findings that are significant at the 0.1 level. The low point estimates (rate reductions at or above 30%) for hospital admissions and ED visits, suggest a potentially high level of clinical significance. While not all our findings are not statistically significant at the 0.05 level, their significance at the 0.1 level gives us makes it likely that these lower rates of hospital admissions are true: there is a 90% chance we can reject the null hypothesis. As more years of data are collected, our estimates should become more precise and also speak to longer-term effects of housing on the utilization of important health care and social services. It should be noted that the higher rates of outpatient mental health services use in the treatment group is likely due to the high degree of interaction with Abode, as Abode bills for their services using outpatient mental health codes.

We recognize that our estimates are conservative estimates of the true effects of providing PSH on health service utilization. Because this is an intention-to-treat framework, we know that many individuals assigned to the treatment group did not receive the treatment (permanent supportive housing), while many individuals assigned to the control group have been placed in housing through programs offered by the county and other mechanisms (*see future analyses section below*). This means that there is some "misclassification" – some individuals assigned

(and analyzed) to the PSH group were not housed while others assigned (and analyzed) to "usual care" received PSH. Misclassification biases results towards the null, meaning that it makes it more difficult to see differences between groups. Due to this, the results should be considered to be underestimates of the true effect of housing.

Over the past three years, there has been a large increase in the number of permanent supportive housing units in Santa Clara County. According to the Santa Clara County Office of Supportive Housing the number of units either available or under construction increased from 1900 in 2015 to 3577 as of August 2018. As a result, we anticipate that more individuals assigned to the control group will receive housing. This may decrease our ability to detect differences as the study continues, and it may be that we are in or near the peak time in our evaluation to detect differences. We will continue to examine the impact of this intervention in the coming months and years and have plans to add on to our analysis (outlined below) that will bring additional breadth and depth to our knowledge of the impact of providing permanent supportive housing to this vulnerable population.

We were able to confirm more deaths in the treatment group, whereas more individuals in the control group are presumed to have moved out of the county. It may be that more individuals in the control group chose to leave the county due to an inability to find housing compared to those who were randomized to the treatment group and direct referral to Abode Services. It is also possible that there is a lag in death reporting to the County, and that we will find in the coming months that some of the individuals we assume moved out of county died.

V. FUTURE ANALYSES

Impact of housing on those who received it: We are working with the County on two additional data elements. First, we are working to obtain complete data from the County regarding housing placements among individuals randomized to the control group and for individuals randomized to the intervention group who were never housed by Abode. These data will need to be reviewed for completeness and quality. Assuming the data are valid, we will estimate the average treatment effect on the treated using instrumental variables regression to better account for the impact of the Abode PSH "treatment" on those who actually received it. The average treatment effect on the treated (ATET) estimate takes into account the fact that adherence with treatment assignment was not perfect, i.e. some assigned to housing were not housed and some assigned to the control group were housed. We will also report descriptive statistics on housing entry and exit dates, and the number of moves for each group as a measure of housing stability that can be examined for both treatment and control groups.

Participant deaths: Individuals enrolled in Project Welcome Home had higher rates of death than we anticipated. We are exploring this further by obtaining death certificates from the County for all individuals enrolled in the study who have died. We will review these data, and examine their utilization after enrollment and up to the time of death to uncover possible predictors for death and to better understand why the death rate in this population is higher than expected. We will also determine whether we must undertake chart review (which would require an IRB amendment) to better understand this phenomenon.

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Appendix 1: Deaths and Attrition

Deaths: Based on the data contained within our information systems (including Abode and County health systems) we have identified 41 deaths (23 in the treatment and 18 in the control group) prior to the end of the reporting period on 06/30/18. The 23 deaths in the treatment group were reported by Abode, and the control group deaths were verified with the help of the County. To determine county deaths, we submitted names of individuals who had not had any type of encounter in any of our data sources for at least six months and these individuals were checked against the county death records. We censored individuals from analyses at the date of confirmed death. The higher rate of death in the treatment group may be due to timelier death records reported by Abode. Given the rate of other attrition in the control group (see below) we expect that over time, these numbers will become more balanced.

Other attrition: Secondly, we examine usage patterns to assess for evidence that an individual was living in Santa Clara County and alive. If an individual had no evidence of use of services in any of our data systems for >180 days and is not known to have died, we assume that the individual has moved or may have died, but that death may have not yet been documented.

Table 1: Cumulative deaths and other attrition in treatment and control groups

Evaluation Group	Control			Treatment		
	Death*	Attrition#	TOTAL	Death*	Attrition#	TOTAL
	18	20	38	23	7	30

*Based on record of a participant's death based on County death records or reporting from Abode
#No encounter in any segment of UCSF dataset in the last 6 months of the analysis period

Appendix 2: Demographic and Utilization Data

Table 1: Demographic and Utilization Data for the Two Years Pre-Enrollment: "Balance Check"

	Control Mean (n=199)	Treatment Mean (n=173)	Difference	p-value
Characteristics				
Male	72.6%	72.3%	0.3%	0.94
Hispanic	26.3%	25.2%	1.2%	0.80
Black	15.6%	12.7%	2.9%	0.43
Other Race	51.3%	54.9%	-3.7%	0.48
Age	50.3	51.1	-0.9	0.45
Smoker	66.8%	65.3%	1.5%	0.76
Medi-Cal Coverage	79.4%	80.3%	-0.9%	0.82
Medicare Coverage	17.1%	16.2%	0.9%	0.82
Primary Care				
Regular Source of Care	81.4%	66.5%	14.9%	0.00
Primary Care Office Visits	8.8	7.4	1.4	0.25
Hospital Use				
Inpatient				
Total Inpatient Visits	5.2	5.3	-0.1	0.89
Inpatient Psychiatric Admissions	0.3	0.2	0.1	0.18
Inpatient Admissions	2.6	2.7	-0.03	0.94
Number Of Inpatient Days	16.0	15.6	0.5	0.88
Emergency Department (ED)				
Total ED Visits	21.4	19.2	2.2	0.27
ED Treat-and-Release Visits	19.2	16.8	2.4	0.22
Admitted ED Visits	2.2	2.4	-0.2	0.62
Psychiatric ED Visits	5.8	5.2	0.6	0.52
ED Visits with Ambulance Transport	6.3	5.3	1.1	0.26
ED Visits with Police Transport	1.3	1.5	-0.1	0.67
Criminal Justice Data				
Arrests	2.8	3.8	-1.0	0.07
Sentence Days	52.1	55.9	-3.8	0.71
Shelter Data				
Shelter Stays	41.2	35.9	5.3	0.47
Shelter Days	46.2	43.5	2.8	0.75
Unicare				

	Control Mean (n=199)	Treatment Mean (n=173)	Difference	p-value
Any Substance Use Service (DADS) Visits	5.8	7.4	-1.6	0.28
DADS, Intake and Individual Treatment Visits	3.0	3.0	0.0	0.99
DADS Treatment Planning Visits	2.7	2.8	-0.1	0.88
DADS Crisis Intervention	0.2	0.1	0.1	0.15
DADS Group Visits	1.6	3.2	-1.6	0.01
DADS Medication Visits	0.4	0.2	0.2	0.40
Any Mental Health (MH) Visits	30.1	28.5	1.6	0.81
MH Management Visits	16.3	15.0	1.2	0.73
MH Assessment Visits	1.6	1.4	0.2	0.49
MH Testing Visits	0.2	0.2	0.0	0.85
MH Individual Treatment	0.5	0.4	0.1	0.75
MH Group Treatment	1.8	0.4	1.4	0.30
MH Rehab Visits	3.5	3.8	-0.3	0.82
MH Medication (MD)	2.5	2.4	0.1	0.88
MH Medication (Non-MD)	4.0	5.1	-1.1	0.56

Table 2: Main Analysis: Demographic and County Services Utilization 24 Months Post-Enrollment

	Control Mean (n=122)	Treatment Mean (n=108)	Difference	p-value
Sample Characteristics				
Days Enrolled	943.5	948.9	-5.3	0.71
Months Enrolled	31.0	31.2	-0.2	0.68
Male	71.9%	72.2%	-0.3%	0.96
Hispanic	33.1%	26.2%	6.8%	0.27
Black	13.1%	13.0%	0.2%	0.97
Other Race	43.4%	48.1%	-4.7%	0.48
Age	49.0	50.8	-1.8	0.21
Smoker	68.0%	65.7%	2.3%	0.71
Medi-Cal Coverage	82.0%	80.6%	1.4%	0.79
Medicare Coverage	13.9%	16.7%	-2.7%	0.57
Primary Care				
Regular Source of Care	80.3%	76.9%	3.5%	0.52
Primary Care Office Visits	11.8	9.3	2.5	0.23
Hospital Use				
Inpatient				
Total Inpatient Visits	3.9	3.1	0.8	0.37
Inpatient Psychiatric Admissions	0.07	0.05	0.02	0.59
Inpatient Admissions	2.1	1.7	0.4	0.36
Number of Inpatient Days	10.5	11.3	-0.9	0.77
Emergency Department (ED)				
Total ED Visits	15.7	13.1	2.6	0.23
ED Treat-and-Release Visits	13.9	11.6	2.3	0.27
Admitted ED Visits	1.8	1.4	0.3	0.42
Psychiatric ED Visits	4.9	2.9	2.0	0.03
ED Visits with Ambulance Transport	5.7	5.5	0.2	0.86
ED Visits with Police Transport	1.4	0.7	0.7	0.01
Criminal Justice Data				
Arrests	2.6	2.6	0.0	0.96
Sentence Days	64.6	63.8	0.8	0.96
Shelter Data				
Shelter Stays	29.9	17.9	11.9	0.10
Shelter Days	32.4	18.2	14.2	0.06
Unicare				
Any Substance Use Service(DADS) Visits	5.4	3.5	1.8	0.19

	Control Mean (n=122)	Treatment Mean (n=108)	Difference	p-value
DADS, Intake and Individual Treatment Visits	2.1	1.6	0.5	0.47
DADS Treatment Planning Visits	1.7	1.3	0.4	0.56
DADS Crisis Intervention	0.04	0.01	0.03	0.20
DADS Group Visits	2.4	1.5	0.9	0.26
DADS Medication Visits	0.2	0.1	0.1	0.34
Any Mental Health (MH) Visits	43.6	83.8	-40.2	0.00
MH Management Visits	23.1	15.7	7.4	0.10
MH Assessment Visits	1.8	2.6	-0.8	0.03
MH Testing Visits	0.7	1.5	-0.8	0.00
MH Individual Treatment	1.8	1.3	0.5	0.48
MH Group Treatment	0.1	0.0	0.1	0.22
MH Rehab Visits	7.6	58.1	-50.5	0.00
MH Medication (MD)	3.4	3.3	0.1	0.84
MH Medication (Non-MD)	5.0	1.3	3.7	0.01

Table 3: Main Analysis: Demographic and County Services Utilization 13-24 Months Post-Enrollment

	Control Mean (n=116)	Treatment Mean (n=100)	Difference	p-value
Sample Characteristics				
Days Enrolled	944.7	953.2	-8.5	0.56
Months Enrolled	31.0	31.3	-0.3	0.54
Male	71.6%	71.0%	0.6%	0.93
Hispanic	33.0%	27.4%	5.7%	0.38
Black	12.9%	13.0%	-0.1%	0.99
Other Race	44.8%	46.0%	-1.2%	0.86
Age	49.2	51.0	-1.8	0.22
Smoker	67.2%	65.0%	2.2%	0.73
Medi-Cal Coverage	81.0%	81.0%	0.0%	0.99
Medicare Coverage	14.7%	16.0%	-1.3%	0.79
Primary Care				
Regular Source of Care	67.2%	68.0%	-0.8%	0.91
Primary Care Office Visits	5.0	4.7	0.3	0.79
Hospital Use				
Inpatient				
Total Inpatient Visits	1.8	1.2	0.6	0.14
Inpatient Psychiatric Admissions	0.03	0.02	0.01	0.83
Inpatient Admissions	0.9	0.6	0.3	0.15
Number of Inpatient Days	4.8	4.4	0.4	0.80
Emergency Department (ED)				
Total ED Visits	7.1	5.7	1.4	0.27
ED Treat-and-Release Visits	6.3	5.2	1.1	0.36
Admitted ED Visits	0.8	0.5	0.3	0.15
Psychiatric ED Visits	2.3	1.1	1.2	0.01
ED Visits with Ambulance Transport	2.7	2.5	0.2	0.82
ED Visits with Police Transport	0.7	0.3	0.4	0.01
Criminal Justice Data				
Arrests	1.3	1.0	0.3	0.35
Sentence Days	32.3	32.0	0.3	0.97
Shelter Data				
Shelter Stays	13.1	3.5	9.5	0.02
Shelter Days	13.6	3.5	10.1	0.01
Unicare				
Any Substance Use Service(DADS) Visits	2.5	1.7	0.9	0.33
DADS, Intake and Individual Treatment Visits	0.9	0.8	0.1	0.86

	Control Mean (n=116)	Treatment Mean (n=100)	Difference	p-value
DADS Treatment Planning Visits	0.7	0.7	0.0	0.95
DADS Crisis Intervention	0.01	0.00	0.01	0.35
DADS Group Visits	1.2	0.7	0.5	0.34
DADS Medication Visits	0.2	0.04	0.16	0.21
Any Mental Health (MH) Visits	22.8	31.2	-8.4	0.12
MH Management Visits	11.9	3.4	8.5	0.00
MH Assessment Visits	0.9	0.7	0.3	0.25
MH Testing Visits	0.3	0.5	-0.2	0.09
MH Individual Treatment	1.0	0.6	0.4	0.47
MH Group Treatment	0.0	0.0	0.0	
MH Rehab Visits	4.1	24.1	-20.0	0.00
MH Medication (MD)	1.8	1.3	0.4	0.28
MH Medication (Non-MD)	2.7	0.6	2.1	0.02

Appendix 3: Negative Binomial Regression Models

Table 1: Negative binomial regression model: 24 months post-enrollment

	Treatment Group	Male	Hispanic	Black	Other Race	Age	Age squared	Smoker	Medi-Cal	Medicare	N
Inpt psych adm	0.9 [0.31,2.62]	0.11** [0.02,0.52]	1.61 [0.44,5.90]	0.46 [0.06,3.33]	1.38 [0.35,5.43]	0.89 [0.68,1.18]	1 [1.00,1.00]	0.83 [0.22,3.05]	0.64 [0.08,5.01]	5.09 [0.55,47.41]	245
Inpt med adm	0.70+ [0.46,1.06]	1.58* [1.05,2.37]	0.61+ [0.36,1.04]	1.96* [1.02,3.73]	1.46 [0.92,2.33]	1.06 [0.95,1.18]	1 [1.00,1.00]	0.67 [0.41,1.09]	1.64 [0.53,5.15]	1.19 [0.34,4.11]	245
Total adm (med+psych)	0.67+ [0.43,1.04]	1.47+ [0.97,2.24]	0.57* [0.33,0.98]	1.89+ [0.98,3.65]	1.50+ [0.94,2.39]	1.06 [0.94,1.18]	1 [1.00,1.00]	0.65+ [0.39,1.08]	1.47 [0.49,4.43]	1.07 [0.32,3.56]	245
Inpatient LOS	0.71 [0.42,1.19]	0.98 [0.55,1.76]	0.65 [0.35,1.23]	1.81 [0.74,4.43]	1.21 [0.71,2.06]	1.05 [0.90,1.21]	1 [1.00,1.00]	0.69 [0.37,1.28]	4.17* [1.29,13.44]	2.77 [0.77,9.91]	245
Total ED	0.9 [0.65,1.24]	1.18 [0.86,1.63]	0.70* [0.50,0.96]	1.34 [0.86,2.06]	1.71** [1.21,2.43]	0.99 [0.92,1.06]	1 [1.00,1.00]	0.9 [0.60,1.37]	0.79 [0.30,2.04]	0.95 [0.35,2.54]	245
ED T&R	0.93 [0.65,1.32]	1.15 [0.81,1.63]	0.70* [0.50,0.99]	1.3 [0.79,2.12]	1.74** [1.19,2.57]	0.98 [0.91,1.06]	1 [1.00,1.00]	0.92 [0.59,1.43]	0.73 [0.28,1.91]	0.92 [0.34,2.49]	245
ED admit	0.68+ [0.44,1.06]	1.65* [1.06,2.56]	0.53* [0.31,0.93]	1.82+ [0.92,3.57]	1.54+ [0.94,2.51]	1.07 [0.95,1.21]	1 [1.00,1.00]	0.66 [0.39,1.12]	1.34 [0.43,4.22]	0.98 [0.28,3.40]	245
Psych ED	0.96 [0.60,1.52]	1.01 [0.59,1.74]	0.95 [0.53,1.66]	0.8 [0.37,1.74]	1.39 [0.82,2.38]	1 [0.89,1.12]	1 [1.00,1.00]	1.69+ [0.94,3.03]	0.59 [0.21,1.61]	1.27 [0.43,3.77]	245
Ambulance transport	0.85 [0.54,1.32]	0.91 [0.56,1.47]	0.61+ [0.36,1.04]	1.35 [0.75,2.44]	2.01** [1.21,3.34]	1 [0.88,1.13]	1 [1.00,1.00]	0.99 [0.60,1.64]	0.68 [0.20,2.38]	0.78 [0.21,2.94]	245
Police transport	0.66 [0.39,1.14]	1 [0.60,1.66]	0.85 [0.51,1.42]	1.44 [0.67,3.11]	1.26 [0.73,2.15]	0.87 [0.74,1.03]	1 [1.00,1.00]	1.61 [0.85,3.07]	0.93 [0.38,2.32]	2.25 [0.75,6.72]	245
Arrests	1.2 [0.80,1.76]	1.76* [1.07,2.89]	1 [0.61,1.65]	1.08 [0.64,1.80]	1.17 [0.75,1.84]	0.94 [0.85,1.04]	1 [1.00,1.00]	2.09** [1.31,3.33]	0.87 [0.46,1.65]	1.06 [0.48,2.32]	245
Sentence days	1.12 [0.64,1.96]	2.50* [1.15,5.44]	1.22 [0.57,2.62]	0.55 [0.24,1.27]	0.52* [0.28,1.00]	1.05 [0.94,1.17]	1.00+ [1.00,1.00]	1.7 [0.82,3.51]	0.66 [0.21,2.04]	0.89 [0.22,3.54]	245
Shelter stays	0.63* [0.39,1.00]	1.3 [0.76,2.20]	1.29 [0.71,2.32]	0.66 [0.30,1.46]	1.05 [0.62,1.77]	1.14 [0.97,1.33]	1 [1.00,1.00]	1.22 [0.70,2.12]	3.69** [1.79,7.61]	2.24+ [0.93,5.40]	245
Shelter days	0.55* [0.35,0.87]	1.39 [0.83,2.32]	1.19 [0.67,2.12]	0.67 [0.31,1.43]	1.19 [0.71,1.99]	1.11 [0.94,1.30]	1 [1.00,1.00]	1.22 [0.71,2.11]	3.63** [1.74,7.59]	2.06 [0.85,5.03]	245
Substance use treatment visits	0.68 [0.35,1.32]	3.20** [1.52,6.73]	0.57 [0.28,1.16]	0.30* [0.11,0.85]	0.49+ [0.23,1.01]	1.40** [1.18,1.65]	1.00** [0.99,1.00]	1.61 [0.83,3.11]	5.20* [1.20,22.63]	2.14 [0.35,12.94]	245
Mental health treatment visits	2.59** [1.77,3.79]	0.66* [0.44,1.00]	0.91 [0.59,1.37]	0.94 [0.55,1.61]	1.03 [0.69,1.55]	1.07 [0.94,1.21]	1 [1.00,1.00]	1.21 [0.83,1.77]	2.19 [0.81,5.90]	2.91+ [0.97,8.79]	245

Abbreviations: outpt = outpatient; inpt = inpatient; psych = psychiatric; med=medical; adm = admission; LOS = length of stay; T&R = treat and release; admit = admitted; ED = emergency department

P-values: +p<0.10; *p<0.05; p<**0.01

Table 2: Negative binomial regression model: 13-24 months post-enrollment

	Treatment Group	Male	Hispanic	Black	Other Race	Age	Age squared	Smoker	Medi-Cal	Medicare	N
Inpt psych adm	5.5 [0.11,277.58]	0.00** [0.00,0.00]	10.57 [0.33,336.44]	8.82 [0.62,125.05]	7.22 [0.49,105.70]	2.4 [0.52,11.13]	0.99 [0.97,1.01]	0.98 [0.03,37.14]	0.03 [0.00,9.30]	0.4 [0.01,28.60]	220
Inpt med adm	0.67 [0.40,1.10]	1.27 [0.77,2.09]	0.84 [0.48,1.45]	2.74* [1.18,6.35]	1.19 [0.70,2.03]	1.15+ [1.00,1.33]	1 [1.00,1.00]	0.79 [0.46,1.35]	1.52 [0.36,6.33]	1.16 [0.26,5.23]	220
Total adm (med+psych)	0.64+ [0.38,1.08]	1.19 [0.69,2.03]	0.74 [0.41,1.31]	2.87* [1.18,6.96]	1.32 [0.75,2.33]	1.15+ [1.00,1.33]	1 [1.00,1.00]	0.7 [0.39,1.25]	1.01 [0.22,4.52]	0.69 [0.14,3.40]	220
Inpatient LOS	0.78 [0.41,1.47]	0.65 [0.30,1.40]	1.08 [0.48,2.40]	3.84* [1.10,13.47]	1.44 [0.72,2.87]	1.19+ [0.98,1.45]	1 [1.00,1.00]	0.86 [0.40,1.87]	0.91 [0.09,9.21]	0.46 [0.04,4.97]	220
Total ED	0.82 [0.56,1.19]	1.15 [0.80,1.65]	0.71+ [0.48,1.05]	1.86* [1.04,3.35]	1.76** [1.18,2.62]	1.01 [0.91,1.12]	1 [1.00,1.00]	1.12 [0.70,1.78]	0.89 [0.35,2.29]	1.03 [0.39,2.76]	220
ED T&R	0.86 [0.57,1.29]	1.1 [0.75,1.61]	0.69+ [0.46,1.03]	1.7 [0.90,3.21]	1.84** [1.20,2.83]	1.01 [0.91,1.11]	1 [1.00,1.00]	1.16 [0.70,1.93]	0.78 [0.29,2.06]	0.97 [0.35,2.65]	220
ED admit	0.65 [0.38,1.12]	1.43 [0.83,2.47]	0.68 [0.37,1.26]	2.80* [1.14,6.84]	1.29 [0.73,2.29]	1.18+ [0.99,1.40]	1 [1.00,1.00]	0.74 [0.40,1.36]	1.2 [0.28,5.03]	0.88 [0.19,3.99]	220
Psych ED	0.70 [0.42,1.19]	1.16 [0.65,2.06]	1.06 [0.53,2.13]	1.01 [0.39,2.58]	0.98 [0.53,1.82]	1.03 [0.90,1.18]	1 [1.00,1.00]	2.10+ [0.99,4.46]	0.87 [0.26,2.90]	1.44 [0.43,4.82]	220
Ambulance transport	0.9 [0.54,1.50]	0.92 [0.54,1.56]	0.55+ [0.30,1.03]	1.74 [0.86,3.53]	2.53** [1.41,4.55]	1.06 [0.91,1.23]	1 [1.00,1.00]	0.9 [0.44,1.83]	0.9 [0.21,3.87]	1.01 [0.22,4.63]	220
Police transport	0.43** [0.24,0.77]	1.51 [0.81,2.80]	1.59 [0.87,2.91]	1.74 [0.63,4.84]	1.05 [0.56,1.96]	0.96 [0.84,1.11]	1 [1.00,1.00]	2.25* [1.05,4.79]	1.06 [0.23,4.98]	1.38 [0.27,7.02]	220
Arrests	1.24 [0.72,2.15]	1.71* [1.03,2.85]	0.79 [0.43,1.45]	1.27 [0.70,2.32]	1.55 [0.89,2.70]	1.05 [0.91,1.22]	1 [1.00,1.00]	1.13 [0.56,2.28]	1.21 [0.57,2.58]	0.96 [0.41,2.25]	220
Sentence days	1.23 [0.62,2.44]	2.85* [1.25,6.51]	0.88 [0.37,2.08]	0.40+ [0.15,1.06]	0.73 [0.33,1.61]	1.08 [0.87,1.34]	1 [1.00,1.00]	2.96* [1.20,7.33]	1 [0.29,3.51]	0.71 [0.15,3.46]	220
Shelter stays	0.11** [0.05,0.24]	1.48 [0.59,3.72]	2.70* [1.02,7.11]	0.43 [0.10,1.84]	0.25** [0.10,0.64]	1.23 [0.93,1.63]	1 [1.00,1.00]	4.61* [1.39,15.32]	2.63 [0.55,12.62]	1.02 [0.17,6.07]	220
Shelter days	0.10** [0.05,0.23]	1.51 [0.60,3.77]	2.63* [1.01,6.89]	0.41 [0.10,1.74]	0.25** [0.10,0.63]	1.24 [0.93,1.64]	1 [1.00,1.00]	4.87** [1.52,15.62]	2.58 [0.53,12.51]	0.99 [0.17,5.90]	220
Substance use treatment visits	0.38* [0.18,0.84]	11.07** [4.62,26.52]	0.99 [0.39,2.50]	1.15 [0.31,4.30]	1.05 [0.45,2.44]	1.16 [0.95,1.41]	1 [1.00,1.00]	1.25 [0.55,2.87]	2.67 [0.53,13.55]	0.76 [0.09,6.45]	220
Mental health treatment visits	1.91** [1.20,3.04]	0.65* [0.43,0.99]	0.75 [0.45,1.26]	0.93 [0.50,1.76]	0.88 [0.57,1.38]	1.08 [0.93,1.26]	1 [1.00,1.00]	1.22 [0.76,1.94]	1.09 [0.37,3.23]	1.41 [0.40,4.97]	220

Abbreviations: outpt = outpatient; inpt = inpatient; psych = psychiatric; med=medical; adm = admission; LOS = length of stay; T&R = treat and release; admit = admitted; ED = emergency department

P-values: +p<0.10; *p<0.05; p<**0.01

Appendix 4: Death Data

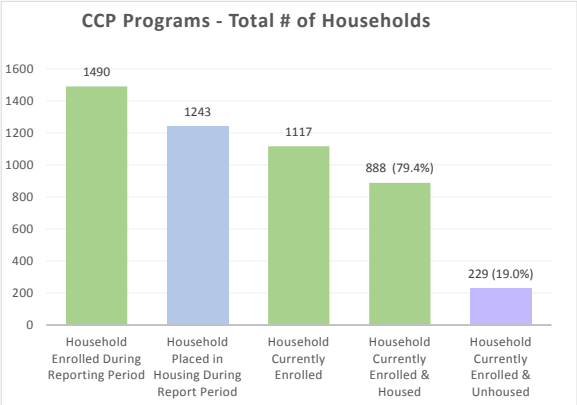
Table 1: Demographic and Utilization for the 24 Months Pre-Enrollment Comparing Participants who Died to Those Who Remained Alive

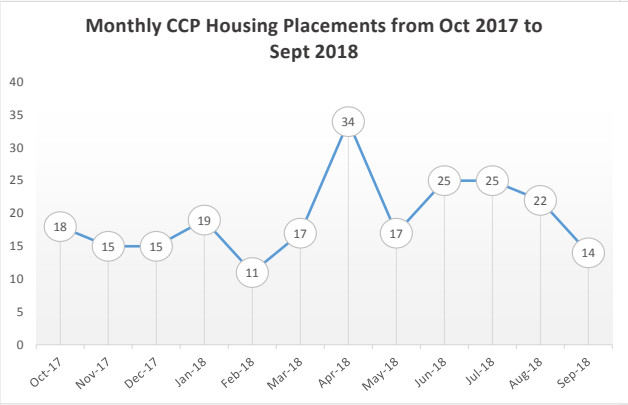
	Alive Mean (n=331)	Died Mean (n=41)	Difference	p-value
Sample Characteristics				
Days Enrolled	766.5	860.7	-94.1	0.05
Months Enrolled	25.1	28.1	-3.0	0.06
Male	71.1%	82.9%	-11.8%	0.11
Hispanic	25.9%	25.0%	0.9%	0.91
Black	14.8%	9.8%	5.0%	0.38
Other Race	52.9%	53.7%	-0.8%	0.92
Age	50.2	54.5	-4.3	0.02
Smoker	66.8%	61.0%	5.8%	0.46
Medi-Cal Coverage	78.9%	87.8%	-9.0%	0.18
Medicare Coverage	17.2%	12.2%	5.0%	0.42
Primary Care				
Regular Source of Care	73.7%	80.5%	-6.8%	0.35
Primary Care Office Visits	8.1	8.9	-0.8	0.68
Hospital Use				
Inpatient				
Total Inpatient Visits	4.8	8.8	-4.1	0.00
Inpatient Psychiatric Admissions	0.3	0.0	0.2	0.07
Inpatient Admissions	2.4	4.6	-2.2	0.00
Number of Inpatient Days	14.2	28.8	-14.6	0.00
Emergency Department (ED)				
Total ED Visits	19.9	24.1	-4.2	0.18
ED Treat-and-Release Visits	17.8	20.0	-2.1	0.49
Admitted ED Visits	2.1	4.1	-2.1	0.00
Psychiatric ED Visits	5.8	3.2	2.6	0.09
ED Visits with Ambulance Transport	5.6	8.2	-2.6	0.08
ED Visits with Police Transport	1.5	0.4	1.1	0.05
Criminal Justice Data				
Arrests	3.4	2.5	0.9	0.33
Sentence Days	56.3	34.1	22.2	0.17
Shelter Data				
Shelter Stays	40.5	24.3	16.2	0.16
Shelter Days	46.6	31.3	15.4	0.26

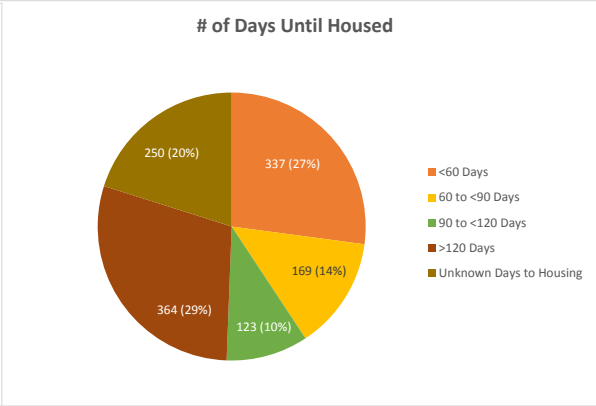
	Alive Mean (n=331)	Died Mean (n=41)	Difference	p-value
Unicare				
Any Substance Use Service(DADS) Visits	6.4	7.7	-1.3	0.59
DADS, Intake and Individual Treatment Visits	2.9	3.7	-0.8	0.51
DADS Treatment Planning Visits	2.6	3.9	-1.3	0.31
DADS Crisis Intervention	0.1	0.3	-0.2	0.03
DADS Group Visits	2.4	2.2	0.2	0.84
DADS Medication Visits	0.3	0.5	-0.3	0.37
Any Mental Health (MH) Visits	30.7	18.7	12.0	0.25
MH Management Visits	16.4	9.6	6.9	0.23
MH Assessment Visits	1.5	0.9	0.6	0.18
MH Testing Visits	0.2	0.1	0.1	0.38
MH Individual Treatment	0.5	0.1	0.4	0.34
MH Group Treatment	1.2	0.0	1.2	0.56
MH Rehab Visits	3.7	3.3	0.4	0.84
MH Medication (MD)	2.5	1.7	0.8	0.37
MH Medication (Non-MD)	4.7	3.0	1.6	0.60

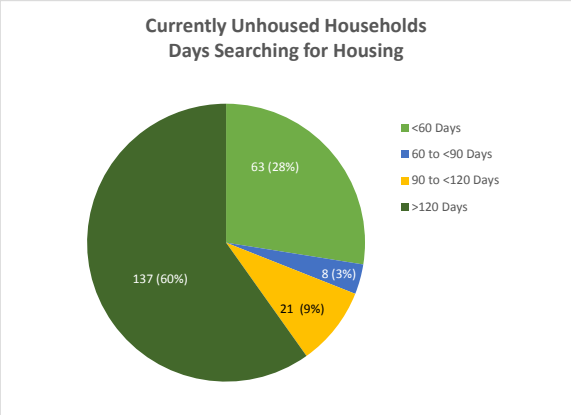
Attachment C

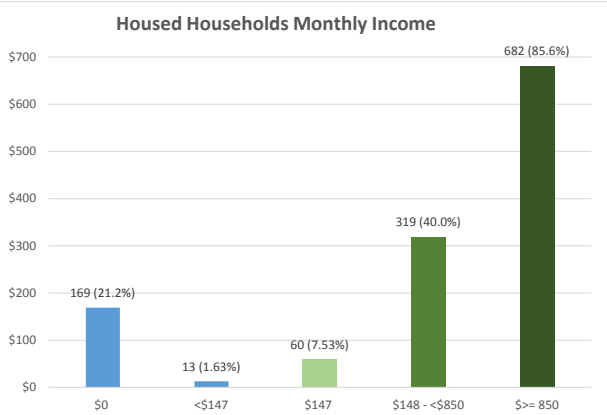
CCP Outcomes Report - July 1, 2011 to September 30, 2018

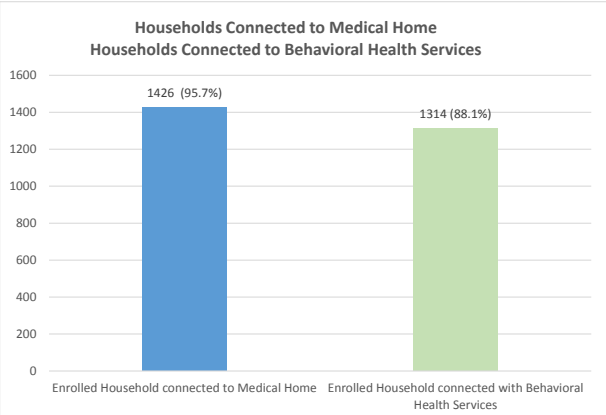




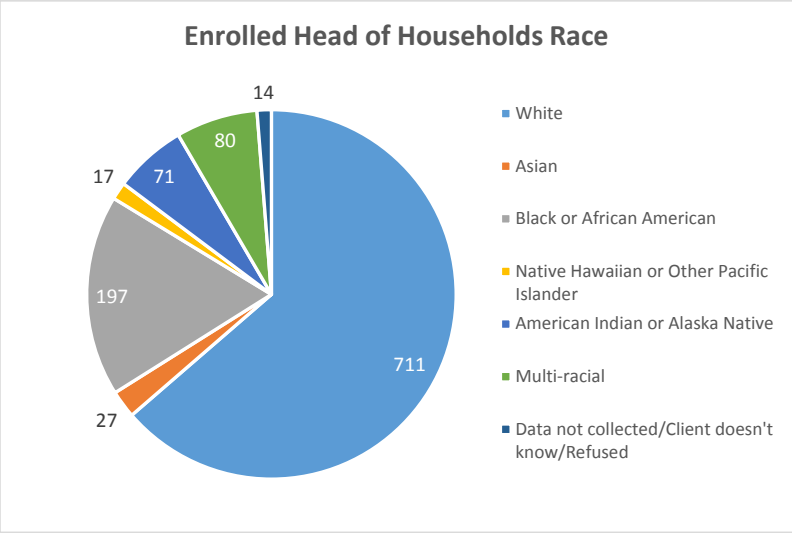
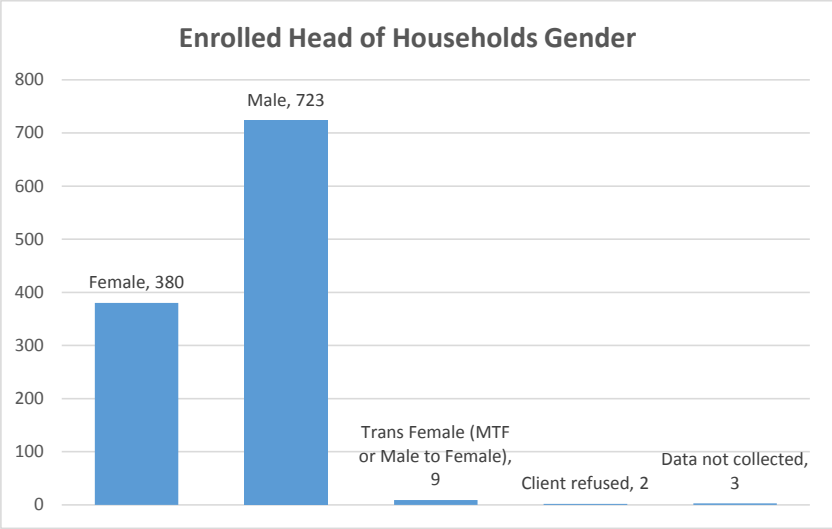
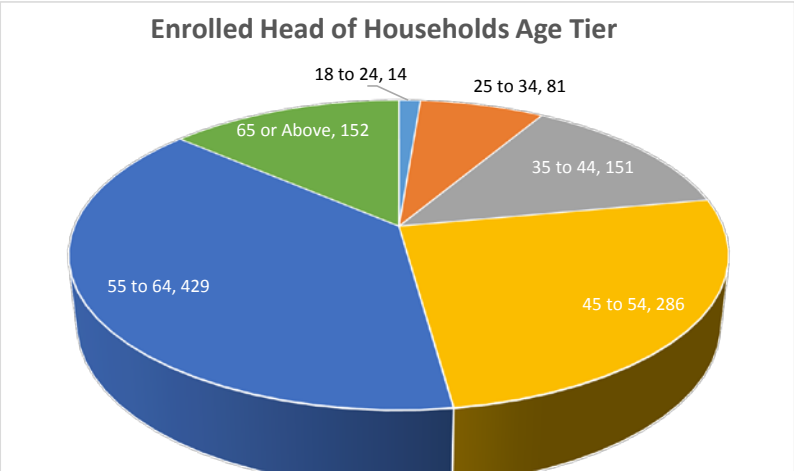
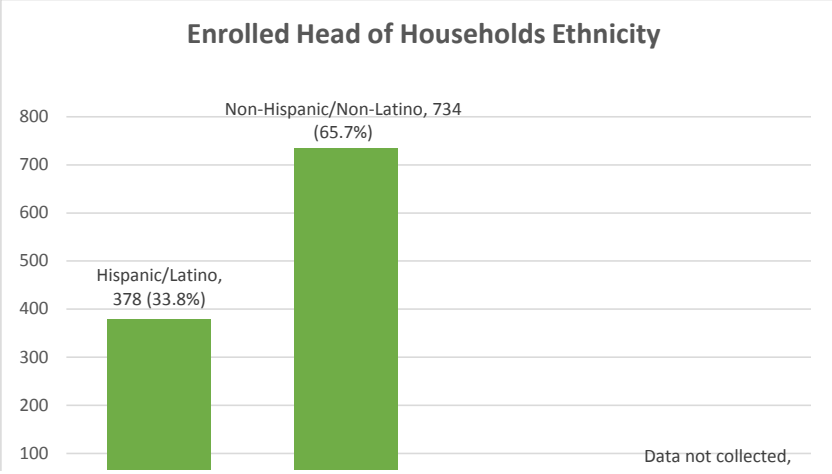








Attachment D

CCP Demographics - Up to Sept 30, 2018

Currently Enrolled Households: 1117