Research Report

Evaluation of Housing for Health Permanent Supportive Housing Program

Sarah B. Hunter, Melody Harvey, Brian Briscombe, Matthew Cefalu

For more information on this publication, visit www.rand.org/t/RR1694

Published by the RAND Corporation, Santa Monica, Calif.

Preface

Housing for Health (HFH), a division within the Los Angeles County Department of Health Services (DHS), was established to provide supportive housing to DHS patients with complex medical and behavioral health issues who were experiencing homelessness. HFH goals are to improve patients' health, reduce costs to the public health system, and demonstrate DHS's commitment to addressing homelessness within Los Angeles County. In August 2014, through the generous support of the Conrad N. Hilton Foundation, the RAND Corporation was selected to serve as the evaluator for the HFH permanent supportive housing (PSH) program. RAND conducted a formative evaluation to provide early feedback on program implementation and performed an outcome evaluation examining the effects of the PSH program on county service utilization and service costs. RAND also analyzed data from a survey on health functioning both at housing entry and a year later among a small convenience sample of HFH participants.

This report includes an assessment of the program structure and program goals and identifies the effects of PSH on service utilization and cost expenditures from several county departments. In this report, we discuss recommendations regarding future programming and research. This report will be of interest to state and county governments serving populations that experience homelessness; health care organizations; clinical practitioners; homeless services advocacy organizations; health care researchers; social workers; and others responsible for providing individuals experiencing homelessness with supportive housing and related care. The research was conducted by RAND Health, a division of the RAND Corporation. A profile of RAND Health, abstracts of its publications, and ordering information can be found at www.rand.org/health.

Table of Contents

Figures and Tables

Figures

Tables

Summary

Study Background and Purpose

Homelessness is a pervasive public health issue, and one that has had a significant impact on Los Angeles County: The county has the highest rate in the United States of unsheltered individuals who experience homelessness, and this rate has continued to increase during recent years. Individuals experiencing homelessness are more likely to have serious and chronic health conditions than the general population. Studies also have shown that individuals living on the street utilize health and other social services at a significantly higher rate than similar individuals who are not experiencing homelessness.

Permanent supportive housing (PSH), a program model that provides long-term housing coupled with case management services, is a promising approach for both improving housing stability for ill people experiencing chronic homelessness and reducing their use of costly emergency and inpatient health care. In 2012, Los Angeles County's Department of Health Services (DHS) launched Housing for Health (HFH), an initiative designed to reduce homelessness, reduce the inappropriate use of emergency room (ER) and inpatient health care, and improve the health of the population experiencing homelessness. The HFH program includes both interim housing (e.g., recuperative or transitional housing) and PSH. Since its inception, the program has created over 3,400 housing placements.

In 2014, Los Angeles County commissioned the RAND Corporation to evaluate the PSH component of the HFH initiative. RAND conducted a formative evaluation of program implementation and then evaluated outcomes, specifically health and social service use and associated costs among program participants. RAND examined data on service use and costs from several county departments: DHS; the Department of Mental Health (DMH); substance use treatment services provided by the Department of Public Health (DPH); General Relief assistance provided by the Department of Public Social Services (DPSS);[1] shelter services provided by the Los Angeles Homeless Services Authority (LAHSA); and law enforcement services provided by the Sheriff's and Probation Departments. The outcomes evaluation addressed the following questions:

1. Did HFH PSH recipients use fewer public services in the year after receiving housing compared to the year prior?
2. Did the change in service use produce net savings to the county?

[1] General Relief is a Los Angeles County–funded program that provides financial assistance to indigent adults who are ineligible for federal or state programs. An average General Relief case consists of one person, living alone, with no income or resources.

3. Was the program associated with improvements in participants' health?

Results

The formative evaluation found that the different entities involved with administering the HFH PSH program had a consistent and shared understanding of the program's purpose, boding well for future program implementation. However, representatives expressed some logistical concerns, such as communication barriers between the multiple entities and uncertainty regarding program expansion and sustainability due to limited operating capacity. Key program staff recognized these concerns and were working to address them at the time of our study.

The outcome evaluation included data from 890 individuals placed in PSH during the first 2.5 years of the program. RAND used a pre-post study design that compared HFH PSH recipients' service use during the year prior to receiving housing compared to the year following receiving housing. A large proportion (83 percent) were experiencing chronic homelessness (i.e., met the U.S. Department of Housing and Urban Development definition of continuous homelessness for a year or more or four episodes of homelessness equal to a year in the last three years) and had co-occurring medical and mental health or substance use conditions (88 percent). Among the analytic sample, the time from initial application to receipt of PSH was, on average, 6.9 months; the time from initial application to receipt of case management was, on average, 4.3 months. More than 96 percent of HFH PSH recipients were stably housed for at least one year.

The outcome evaluation found that clients' use of medical and mental health services dropped substantially, including ER visits and inpatient care. Costs, correspondingly, also decreased. After moving into PSH, participants made an average of 1.64 fewer ER visits in the ensuing year; inpatient hospital stays decreased by more than four days. In addition, outpatient visits were reduced by an average of four visits. PSH recipients' time receiving General Relief declined by an average of 1.38 months. Although the number of individuals arrested and the number of jailed arrests decreased during the year after receiving housing, the number of jail days increased following PSH entry by an average of 2.76 days. The number of HFH PSH recipients using the other services for which RAND had data (i.e., emergency shelters, substance use treatment, and probation services) was quite small both before and after housing receipt.

Across all the services RAND examined, the associated costs for public services consumed in the year after receipt of PSH declined by close to 60 percent. The average public service utilization cost per participant for the year prior to housing totaled $38,146; in the year after receiving housing, it totaled $15,358. When taking into account PSH costs, RAND observed a 20-percent net cost savings, suggesting a potential cost benefit of the program.

The health functioning survey found that participants' mental health functioning improved after receiving housing, though physical health was largely unchanged. At housing entry, participants reported significantly lower physical and mental health functioning than the general population norms, based on national data. One year after being housed, participants reported a

significant improvement in mental health functioning, though scores were still lower than general population–normed values. Physical health functioning scores remained lower than population-normed values and were no different from scores reported at housing entry. Physical health functioning values were consistent with those reported by older individuals experiencing chronic conditions, similar to the population enrolled in the HFH PSH program. These findings suggest that the program serves a population with chronic physical and mental health needs who are likely to benefit from long-term supportive housing.

Implications

These findings suggest that HFH PSH could save money for Los Angeles County. However, the cost results have an important limitation: they measured only services associated with six county departments over a two-year period and are not a full accounting of all potential costs and benefits from the HFH PSH program. Research that employs more rigorous causal methods (i.e., that includes a comparison group) is needed before we can state conclusively that the dramatic changes observed in county service utilization prior to and following supportive housing are solely attributable the HFH PSH program.

In summary, our findings suggest that DHS succeeded in implementing the HFH PSH program. Hundreds of individuals who formerly experienced homelessness, many with complex chronic physical and mental health conditions, have been stably housed at least for one year. Los Angeles County data demonstrate a dramatic reduction in service use across the medical and mental health departments. Overall, the cost reductions more than covered the year's worth of supportive housing costs, as we observed a net cost savings of 20 percent.

As this program is considered for future implementation and sustainability, the ability to scale up with the appropriate level of oversight and collaboration among the different partnering entities will need to be monitored for success. Thus far, the program has successfully enrolled large numbers of individuals and has kept almost all of them in housing for a year while reducing their utilization of costly medical and mental health care.

Acknowledgments

We would especially like to thank the Los Angeles County Department of Health Services' Housing for Health staff. They provided essential information for our evaluation, particularly Ms. Corrin Buchanan, who facilitated our project. We also extend a thanks to Dr. Max Stevens in Los Angeles County's Chief Executive Office for ensuring access to county departmental data. Program and case management staff from Skid Row Housing Trust and Step Up on Second were instrumental in the collection of the health functioning survey component of the project. We would also like to express our appreciation to the individuals who participated in interviews for our formative evaluation. Tiffany Hruby provided outstanding administrative assistance throughout the project. The Conrad N. Hilton Foundation supported this project.

This report was peer reviewed according to RAND's Standard for High-Quality Research and Analysis, available at http://www.rand.org/standards/standards_high.html. We appreciate the reviews by Heather Schwartz and Ricardo Basurto-Davila.

Abbreviations

ACT	Assertive Community Treatment
CCS	Clinical Classification Software
CSS	Los Angeles County Department of Community and Senior Services
CEO-SIB	Los Angeles County Executive Office—Service Integration Branch
CI	confidence interval
DCFS	Los Angeles County Department of Children and Family Services
DD	difference-in-difference regression analysis
DHS	Los Angeles County Department of Health Services
DMH	Los Angeles County Department of Mental Health
DPH	Los Angeles County Department of Public Health
DPSS	Los Angeles County Department of Public Social Services
ELP	Los Angeles County's Enterprise Linkages Project
ER	emergency room
FHSP	Flexible Housing Subsidy Pool
FY	fiscal year
GEE	Generalized Estimating Equation
HACLA	Housing Authority of the City of Los Angeles
HCUP	Healthcare Cost and Utilization Project
HCV	Housing Choice Voucher
HFH	Los Angeles County Department of Health Services, Housing for Health Division
HUD	U.S. Department of Housing and Urban Development
ICD	International Classification of Diseases
ICMS	intensive case management services
LAHSA	Los Angeles Homeless Services Authority
LASD	Los Angeles Sheriff's Department
MCS	Mental Component Summary

NTPS	narcotic treatment program services
PBV	project-based voucher
PCS	Physical Component Summary
PSH	permanent supportive housing
PSM	propensity score matching
RCT	randomized controlled trial
SAPC	substance abuse prevention and control
SD	standard deviation
SNF	skilled nursing facility
SSDI	Social Security Disability Insurance
SSI	Supplemental Security Income
SWOT	strengths, weaknesses, opportunities, and threats
TBSH	tenant-based housing
TBV	tenant-based voucher

1. Introduction

Homelessness is a pervasive public health problem in the United States. California is home to the top five cities/counties with the highest percentages of unsheltered populations experiencing homelessness in the United States (U.S. Department of Housing and Urban Development [HUD], 2016b; HUD, 2015). In 2016, California state legislators requested a state of emergency on homelessness be declared, citing increases in homelessness across several major cities in the state, including Los Angeles, San Francisco, San Diego, and Fresno (California Legislative Information, 2016). In that same year, the Los Angeles County Board of Supervisors approved an action plan to combat homelessness, including the provision of subsidized housing and case management services.

Los Angeles County has the highest total of unsheltered individuals experiencing homelessness of any city or county in the United States (HUD, 2015). HUD defines homelessness as:

1. individuals who lack a fixed, regular, and adequate nighttime residence, including individuals residing in an emergency shelter or a place not meant for human habitation (e.g., street, park, vehicle) and those exiting an institution where they temporarily resided
2. individuals who will imminently lose their primary nighttime residence
3. unaccompanied youth (e.g., minors, adults under age 26) who are defined as homeless under other federal statutes (e.g., the McKinney-Vento Homeless Assistance Act) who do not otherwise qualify as homeless under this definition
4. individuals who are fleeing or are attempting to flee domestic violence, dating violence, sexual assault, stalking, or other dangerous or life-threatening conditions that relate to "violence against the individual" (HUD, 2011).

The federal definition of "chronic homelessness" includes extensive experience of being homeless (i.e., continuously for at least one year or for at least four separate occasions, equaling one year, in the last three years) coupled with a diagnosed physical, mental, and/or substance use disability. Based on the most recent point-in-time count, conducted by the Los Angeles Homeless Service Authority in January 2017, the number of individuals experiencing homelessness increased over the past year by 25 percent to 46,834 (Los Angeles Homeless Services Authority, 2017).[1] Overall, the percentage of populations experiencing homelessness who are unsheltered increased from 70 percent in 2015 to 75 percent in 2016 (Los Angeles Homeless Services Authority, 2016), demonstrating the continued need to address homelessness in Los Angeles County.

[1] These figures exclude the cities of Pasadena, Long Beach, and Glendale. Throughout the report, "individuals" refers to adults only.

Individuals who experience homelessness are much more likely to suffer from serious mental illness (e.g., schizophrenia), chronic medical conditions (e.g., HIV/AIDS), and substance use disorders than the general population (Los Angeles County Department of Public Health [DPH], 2015; National Health Care for the Homeless Council, 2011; Riley et al., 2007). Individuals experiencing homelessness are likely to experience prolonged gaps in health care access, which may result in unusually high rates of acute and intensive health care services, such as emergency room (ER) visits and hospitalizations (Baggett et al., 2010).

Studies have shown that individuals identified as homeless utilize health care services more frequently than comparable nonhomeless individuals of the same age, gender, and low-income status, particularly high-cost services such as ER visits and psychiatric hospitalizations (Hwang et al., 2013). Also, a proportion of individuals who are considered "high utilizers" account for a significant amount of service utilization and costs documented within populations identified as experiencing homelessness. According to a recent report by Los Angeles County's Chief Executive Office (Wu and Stevens, 2016), the county spent $965 million on health, law enforcement, and social services toward individuals experiencing homelessness in fiscal year 2014–2015. The Department of Public Social Services (DPSS) was the largest spender at 30.4 percent (primarily for General Relief, which is a monthly cash subsidy), followed by the Department of Mental Health (DMH) at 30.2 percent, the Department of Health Services (DHS) at 26.5 percent, and the Sheriff's and Probation Departments, which each accounted for approximately 10 percent of spending. These estimates demonstrate that the public burden of homelessness extends beyond health care, suggesting that multiple county agencies have a stake in addressing homelessness.

The county has proposed several initiatives to address homelessness, one of which is to increase the amount of permanent supportive housing (PSH). PSH is a program model that includes providing long-term affordable housing coupled with supportive services (O'Hara, 2007). More specifically, affordable rental housing is paired with intensive case management that links individuals to the health and social services they need to support sustained independent living. There is significant literature on the impact of PSH models on housing stability and public service costs, particularly those efforts that have used a "Housing First" approach (Padgett, Henwood, and Tsemberis, 2015) whereby housing is not contingent upon service participation. This literature is summarized in the next section to provide a background on the existing research to date of the association of housing to public service utilization.

Service Utilization and Costs Among Populations Experiencing Homelessness in PSH Programs: What Previous Studies Show

Previous studies have shown that PSH programs reduce health care and other public service costs by reducing utilization of services. These savings can offset some or even all the program's costs. A recent review of the literature suggests that programs targeting high utilizers are more

likely to lower utilization of public services, saving money that partially or completely offsets program costs (Ly and Latimer, 2015). For example, a PSH program that targeted individuals experiencing homelessness and serious mental illness demonstrated a 95-percent reduction of postintervention public service costs among those who were housed (Culhane, Metraux, and Hadley, 2002); a program targeting individuals who experienced chronic homelessness, had severe alcohol use disorders, and were high users of crisis centers and hospitals showed a cost reduction of 53 percent (Larimer et al., 2009). However, programs that have enrolled individuals with less serious health conditions have yielded more modest cost reductions (Stergiopoulos et al., 2015). Moreover, smaller (partial) program cost offsets tend to be found in earlier phases of the program (Bamberger and Dobbins, 2014; Basu et al., 2012; Brown et al., 2012; Culhane, Metraux, and Hadley, 2002; Flaming, Burns, and Matsunaga, 2009; Larimer et al., 2009; Mondello et al., 2007; Reaser and Mauerman, 2015; Sadowski et al., 2009; Seligson et al., 2013; Stergiopoulos et al., 2015; Thomas et al., 2014; Toros, Stevens, and Moreno, 2012; Tsemberis, Gulcur, and Nakae, 2004; Wright et al., 2016).[2]

We organize prior findings by study design and devote a section to describing Los Angeles County–specific results. This fine-grained review points to great variation in reported service utilization reductions across studies. However, the reductions tended to be similar across comparable study designs and across similar population types. We found that more-rigorous study designs were associated with smaller program cost offsets, and programs targeting sicker populations demonstrated larger cost offsets. We provide more study details including populations served, program characteristics, and study characteristics in Appendix A.

Studies Using Randomized Controlled Trials

Randomized controlled trials (RCTs) are the most rigorous study design because one may be more confident about attributing any differences between a treatment and comparison (or control) group to the program under study due to the random approach used to assign participants to the study groups. We identified a total of four studies that used an RCT design to examine the effects of PSH on health services utilization and associated costs. Overall, these studies found that, relative to control groups, the treated groups experienced a decrease in hospital days by 23 to 29 percent and a decline in the number of ER visits by 24 to 33 percent (see Basu et al., 2012; Sadowski et al., 2009; Stergiopoulos et al., 2015). Also, Basu et al. (2012) found that the treated group used substance-use *residential* treatment significantly less frequently than the control group that was subject to a non–Housing First approach. Tsemberis, Gulcur, and

[2] The program cost offsets were reported in papers or author calculations where cost offsets were not explicitly reported and the cost information was provided. We used Culhane, Metraux, and Hadley's approach (2002) of subtracting the post-housing costs from the PSH program costs to get a rough estimate of cost offsets.

Nakae (2004) found that the treated group had significantly greater usage of substance abuse *outpatient* treatment services than the treatment-as-usual control group.

Studies Using Comparison Groups Derived from Propensity Score Matching

A nonexperimental comparative study is a second-best research design. While this method does not randomly allocate housing to qualified individuals like an RCT, it compares the outcomes of observably similar individuals over time who did or did not receive the treatment, in this case, PSH. We identified three studies (not including Los Angeles–specific studies, which are described in later section) that used a nonexperimental comparative design and included cost analyses. Overall, the studies found that relative to comparison groups, the housing recipients experienced a decrease in hospital days by 13 to 24 percent and jail days by 32 to 38 percent. The rate reduction in days hospitalized was lower than found in the RCT studies.

Culhane, Metraux, and Hadley (2002) was one of the first propensity score matching (PSM) studies to demonstrate the effects of supportive housing on use of public services and associated costs across multiple government departments among individuals who experienced homelessness. The study examined the New York supportive housing model. The study found that the housed group had rate reductions across medical hospital days, mental health hospital days, shelter use days, state incarceration days, and local jail days as well as increases in outpatient visits. However, Culhane, Metraux, and Hadley (2002) found that these reductions in service utilization did not offset all of the PSH program's cost. A more recent study of the New York supportive housing program reported reduced medical hospital, mental health facility, and jail days. In this study, the cost savings from these decreases in service utilization offset all the program's costs and even generated some net savings (Seligson et al., 2013). The discrepancy in findings could be because Culhane, Metraux, and Hadley (2002) concentrated specifically on individuals who experienced homelessness and had a serious mental illness, while the Seligson et al. study (2013) examined a more mature program that had a different staffing structure and included more types of populations experiencing homelessness.

Studies Using Single Group Pre-Post Test Methods

We identified six studies that used a pre-post method (as ours did) to study housing programs. We found four of these studies in gray literature (i.e., they were not peer reviewed). Sample sizes were small, ranging from 29 to 99 participants. Reported reductions in hospital days were 23 to 63 percent, ER visits were reduced by 33 to 78 percent, number of arrests by 67 to 78 percent, and number of jail stays by 62 to 87 percent. Three of the studies reviewed were descriptive, lacking any statistical tests to indicate whether the differences were significantly different than zero. All of these studies found reductions in utilization of various services—such as ER visits, arrests, hospital days, and incarcerations—after participants were housed (Bamberger and Dobbins, 2014; Brown et al., 2012; Mondello et al., 2007; Reaser and Mauerman, 2015; Thomas et al., 2014; Wright et al., 2016).

Brown et al. (2012) and Wright et al. (2016) found that program costs were larger than their cost offsets (programs had a positive net cost); others found partial program cost offsets (Mondello et al., 2007; Reaser and Mauerman, 2015) or total program cost offsets that produced net savings (Bamberger and Dobbins, 2014). Some programs may have been found to produce smaller savings from service utilization because the studies were implemented over a short period of time or because the studies used a small sample. (Anomalies are likely to be exaggerated in estimates from small samples.) For example, Wright et al. (2016) only examined health care costs among Medicaid recipients. Brown et al. (2012) replicated the methods used in Mondello et al. (2007) but concluded that the program's net cost was positive (i.e., program costs were greater than its offsetting savings). The health status of participants in Brown et al.'s (2012) study was unclear, whereas Mondello et al. (2007) included individuals with complex medical conditions or disabilities. The lower preplacement costs found in Brown et al. (2012) may suggest a healthier set of participants.

Bamberger and Dobbins (2014) focused on seniors who experienced homelessness (the average age was 67), with specific attention on those being placed in PSH from skilled nursing facilities (SNFs). They found an 18-percent reduction in SNF days, which saved Medicaid and Medicare $109,524 per tenant per year.

Studies in Los Angeles County

We identified three relevant studies conducted in Los Angeles County (Flaming, Burns, and Matsunaga, 2009; Flaming et al., 2013; Toros, Stevens, and Moreno, 2012). Taken together, the findings from these studies suggest that supportive housing is likely to reduce the frequency and use of costly public services, especially emergency visits, inpatient care, and General Relief.

In the Toros, Stevens, and Moreno (2012) study, individuals were reported to be "the most acutely vulnerable, long-term chronically homeless individuals" residing in the Skid Row neighborhood in Los Angeles at the time of the study, whereas the Flaming, Burns, and Matsunaga (2009) study reported results for different subgroups that experienced periods of homelessness. Individuals included in the Flaming et al. (2013) study were identified from their frequent use of county hospital services. The 2009 report found that both private health care and public service costs (including health care and other social services) for a sample of individuals receiving General Relief who had experienced periods of homelessness decreased by about half when these individuals were *not* experiencing homelessness. Costs for this sample were primarily incurred for health care, and were generally larger for older individuals and those diagnosed with a chronic health disorder. Flaming, Burns, and Matsunaga (2009) also examined service utilization among a population experiencing homelessness that was provided supportive housing as compared to a population experiencing homelessness that was not providing housing. The authors reported that public service costs were lower in the group receiving housing, even after taking into account the costs of supportive housing. More specifically, using 2008 dollars, average public service savings was $2,300 per month (or $27,600/year) and $1,200 per month

(or $14,400/year) after including supportive housing costs, representing a 79-percent reduction in public service costs, mainly in health care.

Toros, Stevens, and Moreno's Project 50 study (2012) found that those who received supportive housing experienced decreases in inpatient and emergency services, incarceration days, and substance abuse residential treatment; however, outpatient mental health and substance use services increased. Average public service costs per individual one year prior to housing was $3,400 per month ($40,800/year). This dropped to $2,100 per month ($25,200/year) for the year after being housed, indicating a 38-percent reduction in public service costs. Moreover, among this group, public service costs continued to fall in the second year following housing entry to $1,200 per month on average ($14,400/year). The authors reported an overall net savings of approximately $4,800 per unit over the first two years of the program because the costs of operating the program were lower than the documented savings from decreased utilization of public services. In the Flaming et al. (2013) study of frequent users of hospital services, one year of public and hospital service costs pre-housing were on average $63,808 per individual; these fell to $16,913 per individual post-housing. Health care costs were estimated to have declined 72 percent, from $58,962 to $16,474 on average per person. After taking supportive housing costs into account for the first year ($15,159), estimated net savings totaled $31,736, which is approximately $2 cost avoidance for every $1 spent in the first year of housing.

Housing for Health Division

Housing for Health (HFH) is a division of DHS that creates and oversees housing programs for individuals experiencing homelessness in Los Angeles County. The goals of HFH are to improve the health of patients experiencing homelessness, reduce the costs to the publicly funded health care system incurred by these patients, and demonstrate DHS's pledge to address homelessness within Los Angeles County (Health Services Los Angeles County, undated). HFH also engages in a number of partnerships with County departments to coordinate housing for people experiencing homelessness, and conducts outreach and engagement with DMH, DPH, and the Los Angeles Homeless Services Authority (LAHSA).

This report and RAND's evaluation focuses specifically on the PSH component of the HFH program. As of April 2017, HFH has provided over 3,400 housing placements since its inception in November 2012 (DHS, 2017). In addition to PSH, there are other interim housing programs that HFH operates that patients may access before transitioning to PSH.

- *Recuperative Care* provides medical services and food in addition to regular program elements for patients experiencing homelessness and recently discharged from a DHS hospital. (DHS, 2014a; DHS, 2014b).
- *Stabilization Housing* provides temporary, transitional housing for eligible DHS patients experiencing homelessness who are awaiting PSH but have no place to stay in the interim. (DHS, 2014a; DHS, 2014b).

RAND did not have access to data on utilization of the interim housing programs, and thus they are not part of this evaluation.

HFH's PSH program follows a "Housing First" approach, meaning that participants are not required to enroll in substance abuse treatment or mental health services prior to being housed (Tsemberis, Gulcur, and Nakae, 2004; U.S. Interagency Council on Homelessness, 2016). The program includes intensive case management services (ICMS) currently provided by more than 20 community-based organizations throughout Los Angeles County. The intensive case management includes client outreach and engagement, ongoing case management, assistance with receipt of proper documentation and benefits establishment, the identification of a medical home along with linkages to mental health and substance use services, assistance with life skills, employment, education, housing and eviction prevention services. A client is referred to an ICMS provider prior to housing, and the ICMS provider continues to serve the client post-housing, providing a continuum of care throughout the different phases of the program. The ICMS provider conducts a client assessment and provides individualized services based on the assessment. ICMS providers are trained to take a "whatever it takes" approach to successfully permanently house HFH participants (DHS, 2017).

To qualify for HFH's PSH program, the client must be experiencing homelessness per HUD's definition and meet these three criteria:

- at least two admissions for inpatient hospitalization and/or emergency-based services within the last year
- resident of Los Angeles County
- extremely low income as defined by HUD (income less than or equal to 30 percent of Los Angeles County's median area income, which in 2016 was $18,250 for a household of one) (DHS, 2014a; HUD, Office of Policy Development and Research, 2016a).[3]

At the time of writing of this report, we learned that around 2015, HFH participants did not need to meet the first criteria (i.e., two admissions of inpatient and/or emergency-based services) to qualify for the program but could be referred based on utilization of DHS outpatient services. This change could impact the potential service utilization and cost impacts of the program.

HFH clients have a variety of community-based housing options available to them, including:

1. nonprofit-owned supportive housing (i.e., buildings with units dedicated to serving individuals and/or families experiencing homelessness)
2. master-leased buildings (i.e., long-term leases of privately owned buildings)
3. scattered-site housing (i.e., units rented from private landlords).

The HFH program uses both federal rent subsidies (i.e., project-based and tenant-based vouchers [TBV]) through partnerships with the Housing Authority of the City of Los Angeles

[3] The manual shows fiscal year (FY) 2014 figures. Our criteria reflect 2016 figures for extremely low income.

(HACLA) and the Housing Authority of the County of Los Angeles, as well as a locally funded rental subsidy program called the Flexible Housing Subsidy Pool (FHSP). The FHSP allows a more-rapid, more-flexible way to fund housing. The FHSP allows clients who may not qualify for traditional options (e.g., they do not meet the criteria for PSH like chronic homelessness or documented disability; they do not meet the criteria for other HUD housing subsidies due to prior convictions) to receive housing and support services. Housing support is provided by the FHSP housing provider and includes working with ICMS agencies to coordinate housing applications and housing viewings. The funds may also be used to help with client move-in costs (e.g., purchasing furniture or household goods). Once a participant is housed, then the FHSP housing agency provides housing retention services, including monthly check-ins to ensure clients' housing needs are met. The FHSP housing agency also addresses landlord or property management concerns (DHS, 2017).

The HFH PSH program process that we investigated included three major phases: (1) client application, (2) receipt of ICMS, and (3) receipt of PSH.

HFH is modeled after the City and County of San Francisco Department of Public Health's Housing and Urban Health Section Direct Access to Housing Program. This program was established in 1999 with the goal of providing housing as a form of health care. San Francisco also has flexible housing subsidy funding that is similar to the FHSP. HFH was established as a means to expand what was done in Housing and Urban Health at a larger scale. A more detailed report on how the FHSP operates is now available (Abt Associates, 2017). More technical information on HFH's program operations are described in the HFH's recent report to the Board of Supervisors (DHS, 2017).

RAND's Evaluation of Housing for Health's PSH Program

RAND reviewed program documentation; interviewed representatives from agencies and county departments involved in program implementation; developed a logic model of HFH's PSH program; and conducted an outcome evaluation of program participants' service utilization and public expenditures using a pre-post study design. RAND also fielded a brief health functioning longitudinal survey among a small sample of HFH participants. The formative aspect of the evaluation highlights the implementation process of the HFH's permanent supportive program. The outcome evaluation examines service utilization across several county departments and estimates the costs of providing these services for HFH participants for the year pre-housing and the year post-housing. The evaluation also provides descriptive information about the program participant characteristics as well as HFH PSH program processes, including housing retention rates.

RAND received funding to initiate its evaluation in July 2014, approximately 20 months after program inception. During the first year of the contract, we participated in a launch meeting with program planners and stakeholders (i.e., representatives from DHS, Los Angeles County

Executive Office—Service Integration Branch [CEO-SIB], Brilliant Corners, and the Corporation for Supportive Housing) to learn more about the program and plan the evaluation. At that meeting, changes to the initial proposed evaluation were made. First, stakeholders requested that a comparison group be added so that service utilization rates and costs could be compared. Second, stakeholders requested that we add a brief longitudinal self-report survey for a subset of participants to capture a better sense of the program's impact on health functioning.

During fall 2014, the RAND team worked with DHS and CEO-SIB to create a data sharing agreement and a data transfer plan that would meet Institutional Review Board requirements. RAND also conducted a formative evaluation. This included review of program documentation and interviews with representatives from involved agencies and departments to gain a better understanding of the program, along with perceptions and expectations about the program. After completing these formative evaluation activities, RAND shared a program logic model and summary of interview findings in December 2014 with the program manager.

RAND's outcome evaluation used data from one year pre-program through June 2016. The outcome evaluation addressed the following research questions using multiple approaches, as further explained in the following chapter:

1. Do HFH PSH recipients use fewer public services in the year after receipt of housing compared to the year prior?
2. Are there overall savings to the county from HFH PSH, taking into account program costs?
3. What changes in health functioning are reported among HFH PSH participants housed for one year?

The first two questions were addressed through secondary data analyses using data provided by county sources. The third question was addressed through a survey effort we conducted with a small subset of HFH PSH participants.

Organization of the Report

This report examines the HFH PSH program's effect on service utilization and service costs and provides recommendations based on those findings. This report is organized by the steps of the research process. This chapter provided an overview of previous literature on this topic and an introduction to HFH PSH program, including its relationship to homelessness, housing, and health care. The second chapter describes the methodology used to conduct the evaluation. The third chapter highlights the results, and the fourth chapter discusses these results and their implications and presents recommendations for future research and programming.

2. Methodology

There were two distinct phases of the evaluation. In the first year, RAND conducted a formative evaluation by gathering information about the program and provided feedback to the HFH program staff. In the second phase, RAND conducted an outcome evaluation that included the following analytic tasks:

- analysis of administrative data from the county and data from the HFH program to examine program implementation and service utilization
- analysis of expenditure data from the county and the HFH program to examine cost expenditures
- analysis of longitudinal survey data to examine health functioning changes over time.

We combined these analytic techniques and data sources to answer the research questions, as demonstrated in Table 2.1. Next, we explain the methodologies behind these research tasks in detail.

Table 2.1. Research Tasks Employed to Address Research Questions

Research Question	Research Tasks Conducted
Do HFH PSH recipients use fewer public services in the year after receipt of housing compared to the year prior?	Analyses of service utilization using administrative data from the county and program data from HFH
Are there overall savings to the county from HFH PSH, taking into account program costs?	Analyses of costs by linking administrative and expenditure data from the county with program expenditure data from HFH
What changes in health functioning are reported among HFH PSH participants housed for one year?	Analyses of self-reported health functioning survey data from a subset of HFH clients over time

Formative Evaluation Analyses: Program Structure, Organization, and Goals

Following the project launch meeting, RAND reviewed technical program documentation to gain an understanding of HFH's PSH program. Documentation included referral and consent documents, quarterly enrollment reports, and program spreadsheets. Then we conducted interviews with representatives from several entities involved with the program to improve our understanding of the service model. RAND identified 10 representatives to interview with consultation from Brilliant Corners, the FHSP housing provider, and DHS HFH staff. We interviewed these representatives between October and December 2014. Four participants were

ICMS providers, five were HFH or DHS staff, and one was from the FHSP housing provider organization. Half of the interviews were conducted by telephone, and the rest were conducted in-person at the representatives' places of work.

We used a semistructured interview protocol based on Gigiu and Rodriguez-Campos (2007). The interview protocol (see Appendix B) included questions concerning the entity's role in the PSH program; outcomes of interest to representatives; lessons learned; and the effects that the PSH program may have at the client, county, and system levels. The interviews lasted between 30 and 60 minutes.

We conducted a content theme analysis of HFH's PSH program structure, organization, and goals using the collected interview data and the program documentation provided to us. We assessed the program's strengths, weaknesses, opportunities, and threats (SWOT) to provide feedback for program improvement. We also used the program documentation and interview data to develop a HFH PSH program logic model. A logic model is a visual diagram that maps a program's inputs, activities, outputs, and outcomes. Inputs are the materials, supplies, or other items that are needed in order to execute the program. Activities are the actions that need to occur in order to carry out the program. Outputs are the products of the activities taken, and outcomes are the participants' and other affected parties' standings generated from those outputs. As noted by Curnan et al. (2004),

> [T]here is value in the *process of developing a logic model*. The process is an iterative one that requires stakeholders to work together to clarify the underlying rationale for the program and the conditions under which success is most likely to be achieved . . . . The clarity of thinking that occurs from the process of building the model becomes an important part of the overall success of the program. The model itself provides a focal point for discussion. It can be used to explain the program to others and to create a sense of ownership among the stakeholders.

From this perspective, consensus in stakeholders' understanding of and perceived goals of the PSH program suggests some degree of fidelity in that stakeholders agree on the program's function and purpose. The HFH PSH program logic model was also created to help HFH staff identify process outputs and program outcomes to monitor, and to inform HFH staff on potential aspects to include in their reporting requirements for participating entities.

An important limitation of this analysis is that the research tasks were carried out at the beginning of the evaluation, prior to major changes that occurred in HFH and in county government. HFH acknowledged that they were beginning to work on several of the issues raised in this component of our evaluation. Limited resources prevented us from conducting a second set of interviews to track any organizational changes or improvements. Nevertheless, this analysis can still provide insights on the strengths and challenges that HFH faced in implementing its PSH program and may provide lessons for other county or local governments that are deciding to carry out a similar endeavor.

Outcome Evaluation: Service Utilization and Cost Analyses

Overview

RAND analyzed service utilization and associated costs of HFH participants one year prior to their move into PSH and one year after their move using data from county departments (as described in more detail in the next section). Once we identified service utilization pre- and post-housing, we applied costs to these services in order to examine expenditures. Next, we compared service utilization and associated costs for the pre- and post-housing periods. Finally, we examined the costs of the PSH program to help identify whether providing PSH to the study population produced a net cost savings. As described in more detail in the following sections, the expenditures we studied were specific to county public services and did include other health care or other services received.

Analytic Sample

The analytic sample included 890 individuals who received HFH PSH from the program's onset up to June 30, 2015. The sample is restricted to that date range because the service data we received was complete through June 30, 2016, and data from one year post-housing was required for the analyses. Three participants that received HFH PSH prior to June 30, 2015 were excluded because move-in dates were missing.

Data Sources

Data on service utilization from January 2010–June 2016 came from Los Angeles County's Enterprise Linkages Project (ELP) and the Los Angeles County Department of Health Services. The ELP is centrally managed and maintained at the CEO-SIB. Established in 2007, the ELP is an integrated data system that includes administrative data from the DHS, DPH, DPSS, DMH, the Sheriff's Department, the Probation Department, the Department of Community and Senior Services (CSS), LAHSA, and Department of Children and Family Services (DCFS) (Byrne et al., 2012; Hamai, 2015). We did not examine data from CSS or DCFS in the evaluation because previous exploration of these data showed little overlap between the adult population experiencing homelessness and utilization of CSS and DCFS services (Stevens, 2014).

The ELP tracks service use in these departments for indigent adults (Byrne et al., 2012). A notable strength of the ELP is that it enables researchers to study the impacts of policies or programs on simultaneous use of multiple services over time. Initially, the goal of the ELP was to monitor General Relief recipients' service use across multiple departments, but the ELP has been used more expansively to study service use among individuals experiencing homelessness and its fiscal impacts (Byrne et al., 2012; Toros, Stevens, and Moreno, 2012; Wu and Stevens, 2016).

While the ELP includes DHS service utilization data, RAND elected to use DHS service utilization data that came directly from the DHS, as it was deemed more complete than the ELP's data, as explained in more detail in the Limitations and Assumptions section later in this report. The diagnosis codes, however, that were used to describe the study sample were derived from the ELP data because the codes in the DHS dataset were not formatted to accurately summarize this information.

Data on general classifications for International Statistical Classification of Diseases (ICD)-9 and ICD-10 diagnosis codes supplied in the ELP's DHS and DMH departmental files came from the Healthcare Cost and Utilization Project (HCUP) Clinical Classifications Software (CCS) (Elixhauser, Steiner, and Palmer, 2015). The CCS groups the 14,000 ICD-9 and 68,000 ICD-10 diagnosis codes into 285 general classifications that can be used in statistical analyses (Elixhauser, Steiner, and Palmer, 2015). HCUP supplies a program that automatically groups the ICD-9 codes into the 285 CCS categories; however, HCUP does not have a program that does the same for ICD-10 codes. Therefore, RAND completed a manual merge of the CCS ICD-10 datafile that lists all ICD-10 codes and their respective CCS category with the diagnosis information from the ELP dataset.

List of Analysis Variables Used

PSH program utilization data for HFH participants came from HFH's administrative program database. HFH's dataset contains point-in-time information about the clients' demographics, health conditions, program usage, and program milestones. These program utilization data were combined with ELP data at the CEO-SIB and then transferred to RAND. Cost data for DHS utilization were obtained directly from DHS in a PDF file that lists average costs for emergency, inpatient, and outpatient services by location for California state FYs 2011–2015. We used the cost estimates for other services provided in the Wu and Stevens report (2016). We obtained housing-related costs directly from HFH and from HACLA.

Table 2.2 lists the variables RAND used in this evaluation. Time-variant outcome variables are expressed as a duration in days per year or as a frequency (number of times used) per year. The outcomes of interest for the HFH clients pre- and post-housing were:

- ER visits
- DHS inpatient hospital days
- outpatient medical visits
- DMH crisis stabilization visits
- DMH inpatient days
- outpatient mental health visits
- substance use treatment times
- months of General Relief receipt
- jail days
- probation days.

Time-invariant variables include demographics and baseline health conditions.

Table 2.2. List of Analysis Variables and Their Department Sources

Variable	Description	Department Source
Outcome Variables		
Medical health services		
Emergency services	Frequency per year that client received any services from any county hospital ER	DHS
Hospitalization	Days per year (duration) that client was hospitalized and received any inpatient medical services	DHS
Outpatient visits	Frequency per year that client made any outpatient medical visit to DHS or public-private partnership facility	DHS
Mental health services		
Inpatient mental health services	Days per year (duration) that client received any acute inpatient or residential services	DMH
Crisis stabilization services	Frequency per year that client received crisis stabilization services	DMH
Outpatient visits	Frequency per year that client made any outpatient mental health visits	DMH
Substance use treatment	Times per year (duration) that client received any substance use treatment	DPH
General Relief: Public assistance/income received	Months per year (frequency) that client received General Relief	DPSS
Jail services	Days per year (duration) client stayed in jail	LASD
Probation services	Days per year (duration) that client was on probation or received any probation services	Probation
Shelter use	Times per year (frequency) that client used any emergency shelters	LAHSA
Descriptive Variables		
Demographics		
Age	Age of client as of June 30, 2016	DHS; HFH
Race	Race or ethnicity of client	DHS; HFH
Gender	Gender of client	DHS; HFH
Treatment Indicators		
HFH program status	HFH client's receipt of PSH	HFH
Case management receipt	HFH client's receipt of case management	HFH
Cost Variables		
DHS ER services	Daily cost of ER services	DHS
DHS inpatient medical services	Daily cost of inpatient medical services	DHS
DHS outpatient medical services	Daily cost of outpatient medical services	DHS

DMH crisis stabilization services	Daily cost of DMH crisis stabilization services	DMH
DMH inpatient medical services	Daily cost of DMH acute inpatient and residential services	DMH
DMH outpatient services	Daily cost of outpatient mental health services	DMH
DPH SAPC services	Daily cost of substance use treatments (residential, day care habilitative, NTPS with detox, NTPS without detox, and outpatient)	DPH
General Relief	Monthly cost of General Relief	DPSS (General Relief)
Jail services (excluding medical services)	Daily cost of bundled services in jail (excluding medical costs)	LASD
Probation services	Daily cost of bundled services in probation	Probation
Housing voucher costs	Monthly cost of housing vouchers	HACLA; HFH
HFH case management	Monthly fee for HFH case management services	HFH

NOTE: LASD = Los Angeles Sheriff's Department; NTPS = narcotic treatment program services; SAPC = substance abuse prevention and control.

Recoding Missingness

We assumed that any participant not found in a particular county department's file did not use any of those department's services. Hence, when service utilization, health conditions, or service cost variables for a client were absent from a department's data, we coded them to zero.

Table 2.3 describes the percentage of the analytic sample observed in each department's file for the period January 2010–June 2016. Among all departments, DHS had the highest percentage of clients in its data.

Table 2.3. Percentage of Sample Included in Each Department

Department	# of Clients	% of Sample
HFH	890	100.0
DHS	859	96.5
DMH	458	51.5
DPH	123	13.8
DPSS	546	61.3
LASD	304	34.2
Probation	132	14.8
LAHSA	465	52.2

NOTES: Overall analytic sample size was 890. The data period is January 1, 2010–June 30, 2016.

Although 96.5 percent of the sample had DHS service utilization during the January 2010–June 2016 period, we found that 39.7 percent of the analytic sample did not have any recorded

use of DHS emergency or inpatient services one year prior to being housed, according to the administrative data DHS supplied to RAND. When we queried HFH program staff about this finding, we learned that around January 2015, program criteria were expanded to include individuals with only DHS outpatient visit in the past year. Even with the changes in program criteria to allow for enrollment with only DHS outpatient service utilization prior to housing, 13.9 percent of the analytic sample did not have any DHS utilization one year prior to being housed. Upon further examination of this 13.9 percent (n = 124), we found that 53 percent (n = 66) had one form of DHS utilization (emergency, inpatient, or outpatient) when examining the time between 12 and 24 months prior to housing. RAND assumed that those who did not have DHS utilization according to the administrative data did not use those DHS services. All participants, regardless of their prior DHS utilization, were included in the analyses.

Analyses Methods

RAND provided descriptive analyses and performed two-tailed t-tests among the raw difference in means and then ran regression analyses on each service utilization outcome controlling for demographics and case management receipt. We conducted difference in means tests for service cost outcomes. All quantitative analyses were completed in STATA/SE 14.2.

Service Utilization Outcomes

Our analyses examined the difference in service utilization among clients one year prior and one year after being housing in the PSH program. Our empirical strategy identified the associated impact of HFH's PSH program on participants before versus after they were housed when holding demographics constant and controlling for case management. We assessed service utilization outcomes using count data models (i.e., robust Poisson Generalized Estimating Equation [GEE] regression with year fixed effects).

Let $SERVICE\_USE_{it}$ indicate the outcome of interest for the *i*th HFH client at quarter *t*, where *t* = 1,…,4 indicates the four quarters prior to housing and *t* = 5,…,8 indicates the four quarters after housing. Let PSH_{it} be a dummy variable for treatment, indicating whether the patient received PSH from HFH in quarter *t*. Since the focus of this analysis was on the one year prior to and the one year following PSH, $PSH_{it} = 0$ for *t* = 1,…,4 and $PSH_{it} = 1$ for *t* = 5,…,8 for all HFH clients. That is, value for PSH_{it} is zero for everyone in the pretreatment period, and one for everyone in the post-treatment period. Let CM_{it} be a dummy variable for the case management component of HFH, indicating whether the patient received case management from HFH in quarter *t*. We assumed that once case management was started, it continued throughout the evaluation period. The client's demographics include age (AGE_i), gender ($FEMALE_i$= 1 if client is female, 0 if otherwise), and race/ethnicity ($RACE_i$= 1 if client is an underrepresented minority, 0 if not an underrepresented minority, and 2 if other/multiracial/unknown).

The final Poisson regression model is given by:

$$\log\left(E(SERVICE\_USE_{it})\right) = \beta_0 + \beta_1 AGE_i + \beta_2 FEMALE_i + \beta_3 RACE_i + \beta_4 year_{it} + \theta PSH_{it} + \phi CM_{it},$$

where $year_{it}$ is a set of indicators of the calendar year of the *i*th HFH patient's *t*th quarter. The coefficient θ represents the impact of receiving PSH, and ϕ captures the effect of the case management component of the program. We used GEE to account for the correlation of observations within HFH clients across time. These models explain how the average utilization would change once clients are housed in PSH. The Poisson model output was converted to marginal effects using a recycled prediction approach that compared the average service utilization receiving PSH to the average service utilization without PSH. Since the Poisson model was service utilization per quarter, these results were annualized by multiplying by four. The final output was the change in average utilization per year.

Cost Outcomes

Our analysis of costs examined how the HFH PSH program impacted expenditures in six of the seven departments represented in the service data provided by the county. Because the data did not include end dates for shelter services, we could not estimate the costs of LAHSA services and thus excluded them from this analysis. The ELP dataset also showed that, among our participant sample, shelter services were rarely accessed. Cost estimates for DHS services, DMH services, DPH services, DPSS's General Relief program, Sheriff Department services, and Probation Department services from California state FYs 2011–2015 come from their respective departments. Additionally, cost information on HFH's housing subsidies and case management services are included in the analyses to see whether cost reductions in other departments produce an overall net savings. Such costs and corresponding fiscal years in which these data were available are listed in Table 2.4.

Table 2.4. Direct Services Costs

Category of Services to Which RAND Attached Costs and/or Cash Benefits	Department Source	Average Cost
Medical services	DHS	*Emergency services:* $1,195 per service (FY 2011); $1,092 per service (FY 2012); $1,126 per service (FY 2013); $1,213 per service (FY 2014); $1,257 per service (FY 2015) *Inpatient hospitalization:* $3,393 per day (FY 2011); $3,486 per day (FY 2012); $3,608 per day (FY 2013); $3,773 per day (FY 2014); $3,909 per day (FY 2015) *Outpatient services:* $763 per service (FY 2011); $754 per service (FY 2012); $777 per service (FY 2013); $823 per service (FY 2014); $853 per service (FY 2015)
Mental health services	Wu and Stevens (2016)	*Acute Inpatient:* $600 per day *Residential:* $150 per day *Outpatient:* $193 per service *Crisis Stabilization:* $469 per service
Alcohol and drug counseling	Wu and Stevens (2016)	*NTPS with detox:* $24 per service and $10 per day *NTPS without detox:* $10 per day *Outpatient counseling:* $24 per service *Residential treatment:* $141 on first day and $115 per day after first day *Day care rehabilitative services*: $33 per day
General Relief	Wu and Stevens (2016)	$221 per month (FY 2011–2016)
Bundled services in jail	Wu and Stevens (2016)	*Booking fee:* $287 per incident *Jail day maintenance cost (blended rate—services, operational, overhead):* $96 per day for men and $125 per day for women
Bundled services of probation	Wu and Stevens (2016)	$555 per month
Housing rental subsidy (voucher)	HACLA	*HCV, homeless, TBSH, PBV:* $867.97 per unit per month *HUD-VASH:* $785.33 per unit per month *Shelter plus care:* $729.26 per unit per month
PSH	DHS-HFH	*Case management services:* $450 per month *FHSP voucher:* $825 per month

NOTES: These are average costs per person for FY 2015 unless otherwise noted. General Relief costs have not changed, so cost applies to all fiscal years. HCV = Housing Choice Voucher; TBSH = tenant-based housing; PBV = project-based housing; HUD-VASH = U.S. Department of Housing and Urban Development—Veterans Affairs Supportive Housing.

The utilization data came from DHS or the ELP via county departments. We then relied on representatives from CEO-SIB, DHS, or the respective departments to provide cost estimates for all types of service utilization. In all cases where there is only one fiscal year of cost data available except for LAHSA, General Relief, and HFH-related services, we applied that cost across all fiscal years while adjusting for inflation using the non–seasonally adjusted Consumer Price Index for All Urban Consumers (CPI-U). FY 2016 costs for DHS services were also adjusted for inflation based off of the FY 2015 costs.

We analyzed cost expenditures among HFH clients one year prior and one year after PSH participation (as further explicated in Table 2.5). We provided descriptive statistics and conducted a two-tailed t-test for difference of means of program costs for all County departments.

Table 2.5. Description of Cost Variables for Analyzing Cost Expenditures

Outcome Variable	Description
Physical health services costs	Costs of ER visit Daily cost of inpatient medical services Cost of outpatient medical care per service
Mental health services costs	Daily cost of acute inpatient and residential services Costs of outpatient mental health services per visit Costs of crisis stabilization per visit
Substance abuse treatment costs	Daily costs of DPH's SAPC services[a]
Costs of bundled services in probation	Daily costs of bundled services in probation
Costs of bundled services in jail	Daily costs of bundled services in jail

[a] DPH outpatient treatments are treated as one day per visit.
NOTE: Excludes examining General Relief because we are multiplying General Relief utilization results by General Relief costs.

Limitations and Assumptions

There are several limitations to this study. In this section, we discuss issues regarding the data that influence the scope and conclusions that we can draw.

We primarily relied on individual department county service utilization data available from the Los Angeles County Executive Office, which maintains the ELP. The ELP was originally developed and implemented in 2007 as a case management application for DPSS to administer the county's General Relief program. The system and attendant documentation is therefore structured in relation to General Relief and does not include a traditional codebook. The Los Angeles County Executive Office shares ELP data with outside partners to the extent that they verify their capacity to navigate the ELP and use the data on the basis of ad hoc documentation and guidance provided by county personnel. This report reflects our verification to this effect, although it is fair to say that the absence of an ELP codebook renders work with the data more difficult and introduces the potential for error. We took multiple steps to prevent misinterpretation of the data—e.g., we clarified the meaning of each variable in the dataset with representatives from the CEO-SIB and other county departments. We provide further description of how we interpreted the variables in other areas of the report.

The CEO-SIB reported to us that, as the ELP has been in existence for a decade, a number of data systems contributing records to the ELP have changed, which means that file structures and variables often have changed as well. It is a mistake to view the ELP as a system, as it is more of an amalgam of disparate administrative data systems. The county is able to take significant steps towards standardizing these systems within the ELP. For instance, the same algorithmic encryption application used to anonymize the data has been used throughout the ten years of the ELP's existence, even as the code written specifically for this application has had to be modified to account for structural changes in agency-level data. Over a period of ten years, however, it has

been quite challenging to resolve structural incongruities across departmental recordkeeping processes, creating a second factor that introduces the possibility of small-scale error.

We also identified data discrepancies that warrant further investigation. More specifically, the initial DHS dataset that we received from the ELP showed that about one-third of the HFH participants did not have any ER or county hospital visits in the year prior to enrollment in HFH. Because ER or county hospital stays in the past year were part of program criteria, we brought this finding back to the HFH program team to help resolve whether this finding was due to missing data or to a change in program criteria. It was first described as a potential missing data concern, so the HFH team coordinated an additional data pull directly from the DHS administrative database. We found that the DHS dataset that we received via the ELP and the dataset we received directly from DHS did not overlap in terms of service records, and there was no systematic pattern to clearly discern similarities and differences between the two files. With consultation from HFH program staff, we decided to include the dataset we received directly from DHS in our analyses, as it was assumed to be more accurate. However, this did not resolve the program criteria discrepancy.

The timing and result of the discrepancies found between the DHS and ELP datasets led to changes in the evaluation study design. We had initially planned to use the DHS ELP dataset to characterize the HFH participants, then use these data to identify a group of similar individuals who *did not* receive housing in the ELP database to serve as a comparison group, using propensity matching methods. However, since we were not confident that the ELP data regarding DHS service utilization was accurate for the HFH participants, we could not use that information to help identify individuals with similar DHS utilization patterns to serve as a comparison group. Following the initial draft of this report, we learned that the HFH program criteria had in fact changed over time, allowing for DHS patients with only outpatient visits to be eligible. But because we had not resolved the data discrepancy problem between the ELP and DHS dataset at the time of draft writing, we could not move forward with the comparison group evaluation design. Moreover, even after applying the new program criteria of any DHS service utilization in the year prior to housing entry, 13.9 percent of the sample from the DHS data set still had no reported utilization, suggesting some accuracy concerns. Since we were unable to detect any systematic errors, we assume that data were missing at random for this study and include all participants, regardless of 12-month pre-housing DHS utilization rates, in the analyses.

As a result of the limitation outlined above, we decided to use a single group pre-post test study design. This study design is susceptible to regression to the mean, which is a statistical phenomenon where a person performing at their best (or worst) is naturally more likely to return to their average behavior with or without any intervention. In the context of Housing First programs, intervention tends to be offered during a time when an individual experiencing homelessness is having an emergency or is in crisis state (Kertesz et al., 2016; Ly and Latimer, 2015). As such, an individual's service use may decline within a moderate timeframe after the emergency or crisis subsides, even if the individual was not housed. This issue is particularly

relevant for the HFH PSH program, given that the majority of potential participants were identified as a result of their recent use of emergency and inpatient service services.

There are other important limitations in regard to the other datasets used. We relied on the HFH administrative database to help describe participants and their program activities (e.g., dates of program milestones like receipt of case management or receipt of housing). However, at the time of this study, the HFH program database did not maintain longitudinal data. Rather, it consisted of a master file that was overwritten each time a new event or change was noted for a client. The cross-sectional nature of the data limits us from making inferences with respect to changes in service utilization. For example, we cannot definitively say a decline in General Relief receipt was linked to receipt of other public assistance (e.g., Supplemental Security Income [SSI]) because we do not know when the client first started receiving other public assistance.

Furthermore, the HFH administrative dataset does not contain information about clients' interim housing use while waiting for PSH. While the focus of this evaluation is on HFH's PSH program, we would ideally account for interim housing use for the cost analyses. Not accounting for interim housing may inflate the estimates we report about the impact of PSH on county costs. The magnitude of the bias, however, would depend on how many clients were involved in interim housing, the cost of that interim housing support, and how long it lasted.

There are other important study limitations to report in regard to the cost analyses. We want to emphasize again that this study focuses specifically on use of county services, as the ELP does not contain information on utilization of noncounty hospitals or other health care or related services provided by noncounty entities. It is likely that individuals experiencing homelessness used noncounty services, as well as county services, and this is not accounted for in our analyses. Also, the cost data contained in the ELP dataset are limited in that they are generally expressed as prorated averages and not linked to actual individual utilization. Individual HFH client usage of services may have incurred costs to county government departments that exceed or fall short of the average costs used in these analyses.

Limits to our study may also impact the generalizability of the findings to the broader population eligible for HFH PSH. The first is at the point of entry to the program. Approximately one in three eligible patients referred to HFH successfully enrolled in the program, and there may be underlying differences between patients that officially enroll or are deemed ineligible and patients that do not. Lacking data on those who were referred but decided not to enroll, we are not able to assess if there is any systematic bias at enrollment. The second is in regard to those who exited the program early (e.g., refused to stay housed or moved in with family). While attrition is natural, it might occur disproportionally among certain subgroups. To ensure that this type of attrition was not an issue, RAND examined the probability of leaving the program by age, gender, and race/ethnicity. We did not find that attrition was disproportionately occurring among these subgroups.

Outcome Evaluation: Health Functioning Survey

We targeted a convenience sample of 100 HFH participants for a health survey at housing entry and at one year post-housing entry. The purpose of the survey was to collect self-reported information from participants about their health functioning to document any changes over time that might not be adequately reflected in the utilization of county services. In other words, we implemented the survey to provide more descriptive information obtained directly from participants about their health functioning over time.

Measure

DHS and RAND agreed to utilize QualityMetric's SF-12v2 Health Survey for this purpose. It is a reliable and valid measure composed of 12 items that assess physical and mental health status (Ware, 2002). Studies have shown it is an appropriate measure for use with populations experiencing homelessness (Chum et al., 2016; Larson, 2002). The SF-12v2 allows for separate physical health and mental health functioning scores, called the Physical Component Summary (PCS) and Mental Component Summary (MCS), respectively. The PCS and MCS each have a range of 0 (worst health) to 100 (best health). The PCS items focus on general health, mobility, amount of work or regular daily activities accomplished, and limitations due to physical problems or pain. The MCS items focus on depression and anxiety feelings, amount of work or regular daily activities accomplished, and limitations due to emotional problems. The scoring of the PCS and MCS is norm based, so that the general population average score is 50 and the standard deviation (SD) is 10.

Procedures

RAND trained case management staff at two participating ICMS agencies (i.e., Skid Row Housing Trust and Step Up on Second) to administer the SF-12v2 to new residents as part of their initial assessment at housing entry and then approximately one year later. Participants could fill out the survey, or it could be administered by a case worker. The estimated administration time was two to three minutes. Data collection occurred between April 2015 and January 2017. Participants received a $10 gift card at each data collection timepoint (i.e., baseline and 12-month follow-up).

Analyses

We examined average scores at housing entry and one year post-housing on the physical and mental health component summaries (i.e., PCS and MCS). Also, we conducted paired t-tests to compare scores from each participant at housing entry to one year later on both the PCS and MCS.

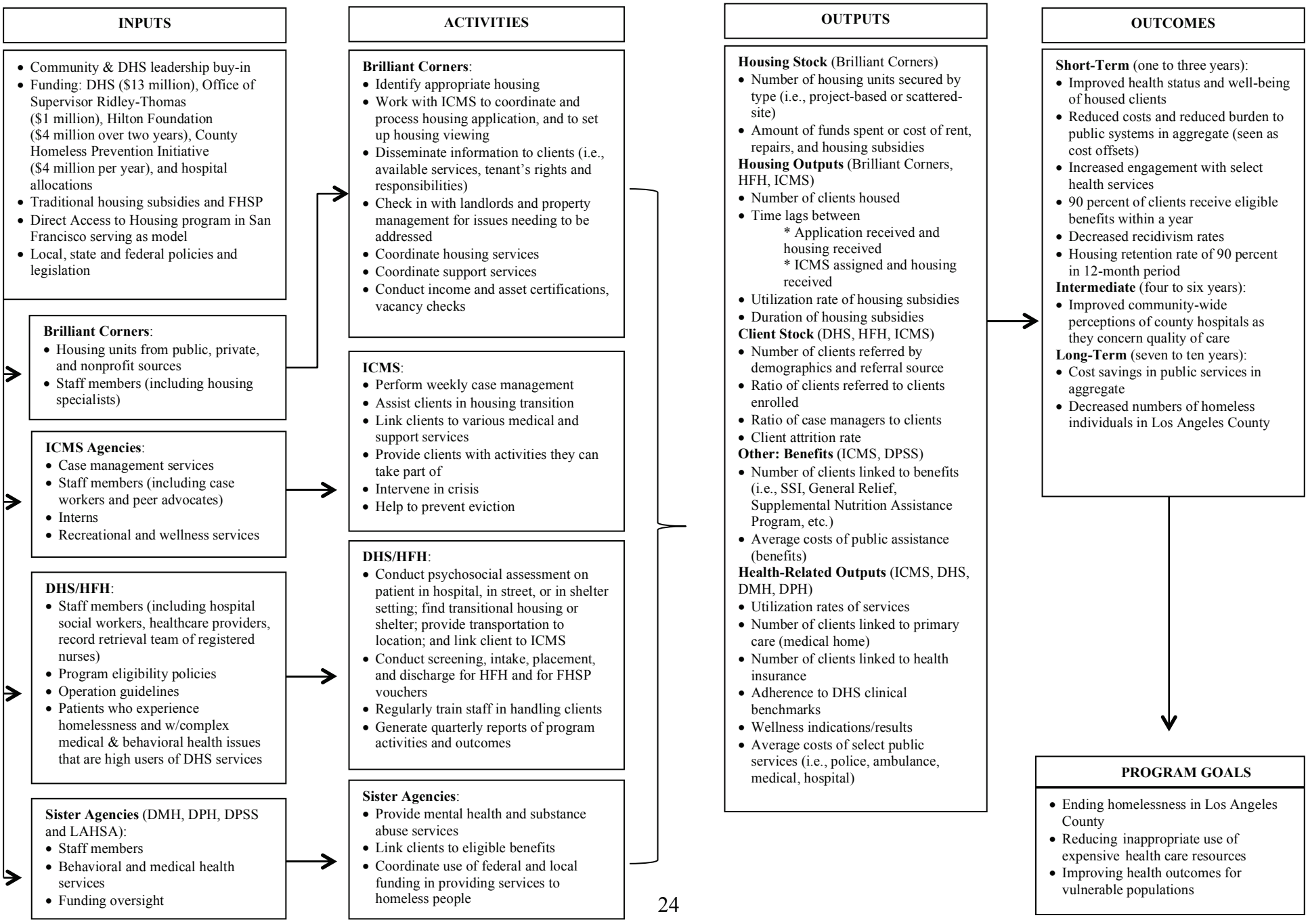
3. Results

In this chapter, we present the findings from the formative evaluation activities. We then provide outcome evaluation results: descriptive information about participants and program activities, service utilization and associated costs findings, and health functioning survey results.

An Overview of the HFH Program: Connecting Inputs to Outcomes

The logic model RAND shared with HFH staff is offered in Figure 3.1. The structure of a logic model varies from program to program and oftentimes reflects program complexity. This logic model reads left to right. The major set of inputs are distributed to four main entities: Brilliant Corners; ICMS agencies; DHS and HFH; and sister agencies, consisting of DMH, DPH, DPSS, and LAHSA. Each of these four main entities then contributes its own set of resources to the HFH PSH program. Next, we show that each of these four main entities perform a unique set of activities that corresponds to its program roles. These activities then cooperatively result in five major outputs: housing stock, housing outputs, HFH participants, benefits establishment, and health-related outputs. The outputs cooperatively lend themselves to a set of program outcomes (e.g., housing stability or retention, reduced utilization of high cost public services), and these outcomes ultimately lead to the fulfillment of the HFH PSH program goals.

Figure 3.1. Program Logic Model



SWOT Analysis of the HFH Program Using Key Program Staff Interviews

Using the data collected through interviews with representatives from the participating entities, we organized the qualitative themes that we generated into the SWOT framework (see Table 3.1). We shared this information with HFH program staff to help with further program planning and implementation. Below, we provide a summary of those findings.

Strengths: Consensus on Program Goals, Responsibilities, and Seeing HFH as Unique

The representatives that we interviewed described the HFH PSH program and FHSP similarly, indicating a common understanding of the program and its intents. All respondents were in agreement that housing is an important component to health care. Many of them were familiar with the multiyear targets identified by DHS leadership. This implies a shared knowledge about the HFH PSH program and that the mission of HFH had been well described to participating agencies.

All the representatives that we interviewed reported that the economic outcomes that the program could achieve at the county level were related to cost savings or effectiveness. All respondents also mentioned that the potential economic outcomes of the program at the community level were decreased hospitalizations, decreased use of public services (e.g., police), and a more efficient use of public services (e.g., using outpatient instead of inpatient services). One respondent also said that the program could potentially improve community-wide perceptions of county hospitals. Participants were knowledgeable about the potential cost savings that HFH's PSH program could potentially generate.

Most respondents noted that the possible system-level outcomes of the program were to set an example for other departments and encourage collaboration within county government. The program may be later expanded to address populations who experience homelessness identified by other county departments.

Interviewees noted that the HFH PSH program was unique to Los Angeles County. Representatives from the housing and case management side of the program described the HFH program staff as helpful in troubleshooting, and they appreciated that service providers were considered as the experts in addressing the needs of clients. The low barrier to program entry (i.e., participants were not required to engage in mental health or substance use services prior to entry) was also noted as a strength of the program.

Table 3.1. SWOT Findings Concerning Program Structure, Organization, and Goals Among Key Stakeholders

	Positives	Negatives	Mixed Findings
Internal	**Strengths** • All indicated similar roles and responsibilities across agency types, implying consistency in roles and responsibilities across agency types • All had similar perceived goals of HFH and of FHSP; many were familiar with the multiyear targets identified by DHS leadership • All agreed on the economic outcomes that the program could have at the county and community levels (i.e., cost savings to county, more-efficient use of public services) • Most said that this program could set an example for other departments and may encourage collaboration • All found HFH to be unique and found it important to consider housing as healthcare; all stakeholders were on board with the overall idea and mission of HFH; "cross-sector" nature (housing with health) noted as unique	**Weaknesses** • Some had specific outcomes or benchmarking goals in mind, while other stakeholders did not • Most identified the need to better coordinate with sister agencies so that clients can get the services they need • Many were concerned about program expansion; working across larger geographical areas will require more resources or complex strategies • Few identified lessons learned thus far in administration and design of HFH; most tended to express general concerns or referred to past lessons from other programs; most did not articulate what was ineffective, and thought it was too early in the program to identify lessons learned of HFH or what was ineffective	• Most identified multifaceted outcomes that the program could generate at client level; representing a holistic approach that housing is not the end goal but the initial vehicle to improve lives of individuals who formerly experienced homelessness; however, it is unclear if all client improvements are being captured
External	**Opportunities** • Medicaid expansion might be able to fund PSH services in the future • Currently has major political support countywide	**Threats** • Program funding and program sustainability related to multiple factors: preparing for a "rainy day"; potential funding cuts for subsidized housing; property owners raising rents/not accepting FHSP • Politics and policies: changes in administrative oversight not in favor of PSH • Eventually will need a plan to tackle the needs of the "too sick" or clients with unique, complicated situations	• Researching and calculating the degree to which program cost are partially or fully offset may be challenging • Coordination and interagency communication among DMH, DPH, DPSS, and LAHSA needs improvement

Weaknesses: Lack of Specific Benchmarking Goals, Unable to Identify Lessons Learned, and Uncertainties About Staffing Projections or Intra-agency Coordination

Some respondents reported specific outcomes or benchmarking goals in mind for their agency/program role, while other respondents did not. Most interviewees noted program goals that were related to their own role (e.g., ICMS agencies discussed housing retention goals but not goals associated with service utilization). Not all representatives were aware of specific program outcomes or benchmarking goals related to the HFH program overall (e.g., number of participants stably housed each year, time to receipt of case management and/or PSH). These may be areas to target for program improvement.

Most respondents identified the need to better coordinate with sister agencies so that clients can get the services they need. For example, HFH DHS staff and housing providers did not always know when the ICMS provider had initiated services with a client. Respondents were concerned about what the lack of coordination with sister agencies would mean for program efficacy and sustainability. If the program continued to expand, it would require more staff across agencies to communicate with one another. There is awareness within HFH that this is a weakness, and HFH was working on this issue at the time that interviews took place. The number of organizational changes taking place at the county level may soon alleviate concerns related to collaboration, especially as the DHS, DPH, and DMH merge into one department.

Most respondents reported that the outcomes the program could generate at the organizational level are to identify program staffing and capacity needs. Some agencies suggested that HFH staff are working with them to help expand service delivery to meet client needs. We reported back to the HFH staff that they may wish to assess staffing needs regularly across all agencies in order to ensure adequate staffing as the program expands and communicate that to participating agencies. Many respondents were concerned about program expansion since working across larger geographical areas will require more resources or complex strategies (e.g., possible satellite offices).

Few respondents identified lessons learned thus far in administration and design of the HFH PSH program. Interviewees tended to express general concerns or referred to past lessons from other programs. Most respondents did not articulate any aspects of the program that were ineffective. Many noted making small changes since program inception based on what they learned was working best on the ground. Most respondents thought it was too early in the program to identify lessons learned in the administration and design of the HFH PSH program or what is ineffective about the program.

Table 3.2 lists aspects of the PSH program that respondents identified as particularly effective or not particularly effective. Items that were identified as being particularly effective were strongly in line with “Housing First” approaches. Items that were identified as not being particularly effective were aspects that might create extra work for both participants and program staff.

Table 3.2. Identified Aspects of Program That Are Particularly Effective/Not Effective

Effective	Not Effective
Client choice in which housing they want or where they want to live	Duplications in tasks (i.e., when multiple parties perform background checks or visit home for same or similar reasons)
Idea that a property management company is involved in households	Stakeholders who work directly with clients not being promptly notified when clients have been assigned to a case manager
Catching clients when they are in trouble and have them surrender unit instead of letting them get evicted	
Low barriers to getting clients housed	
Using "whatever it takes" approach	
Less bureaucracy; program not "too structured" at outset	

Opportunities: Pending Legislation

At the time of the interviews, stakeholders noted that they were looking into the possibility that recent legislation regarding Medicaid expansion (Assembly Bill 361) might provide an opportunity to fund PSH services. If Medicaid dollars could cover some of the PSH service costs, then it could free up some of the costs incurred by the county. However, since the interviews were conducted, HFH program staff learned that this expansion in Medicaid could not cover PSH costs.

Threats: Program Sustainability in Consideration of Future Funding, Oversight, and Limitations with Served Population

The representatives we interviewed mentioned a few threats to HFH's PSH program and the FHSP's continued implementation and expansion. Some factors included preparing clients and the program for a "rainy day" (when clients or the program are short on funds); potential program funding cuts or additional cuts to HUD subsidies that might increase demand and burden on the FHSP; and property owners deciding to raise rents or not accepting the FHSP subsidies. These factors could reduce available funding for the FHSP or threaten the program's sustainability.

Another reported threat to the program was related to affordable housing policies. One of the major concerns included the ability (via a local affordable housing policy) for developers to pay their way out of setting aside units for low-income housing by paying an in-lieu fee. The purpose of the in-lieu fees are for future development of affordable housing, but this still means that there will be fewer potential units available for HFH clients. One of the respondents pointed out that there is a major disconnect between federal policies and developer policies regarding affordable housing. There could also be administrative changes at the federal level and changes in those who oversee federal rental subsidies, and any change in county administrators could mean a drop in support for PSH efforts.

Last, concern was expressed about the target population served. Respondents indicated that clients who HFH currently serves are "sick" but not "too sick" to house (i.e., can live independently with case management support). HFH may eventually come across patients with a very unique set of needs that they may have trouble placing within their program. There will eventually need to be a plan to address the needs of the "too sick" or clients with unique, complicated situations.

Both Positive and Negative Findings

Most respondents indicated that the client-level outcomes to date were improving independence, self-sufficiency, and stability. They noted that the outcomes did not only include obtaining and retaining housing, but also psychological components, such as "thriving," "restoring dignity," "building confidence," and "improving quality of life." The reported outcomes were multifaceted and represented a holistic approach; housing was not perceived as the end goal but an initial vehicle to enhance the lives of individuals who formerly experienced homelessness. These mentioned outcomes also represented the respondents' understanding and support for the "Housing First" approach, where it is recognized that stable housing is a foundation to addressing other physical and mental health needs. However, it is not clear whether these client improvements were being captured in any systematic way.

A couple of respondents mentioned the importance of distinguishing between partial program cost offsets and complete program cost offsets (net cost savings). Particularly, they speculated that we would see partial program cost offsets at the beginning of program implementation as participants are housed and start to use less intense health services than crisis care, but we would not see net cost savings until later, after participants' health conditions became more stable. While some stakeholder organizations that contribute funding may be hoping to see net cost savings, even partial program cost offsets demonstrate the capacity for the program to provide more efficient use of resources.

There was also widely shared sentiment that coordination and interagency communication with DMH, DPH, DPSS, and LAHSA needed improvement. While this could be seen as a weakness, HFH has actually used this as an opportunity to partner with these entities in various ways to help them develop their housing programs for their clientele or to expand the use of the FHSP for other entities. This is an opportunity that may expand as DHS, DMH, and DPH are integrated into one entity.

Outcome Evaluation: Service Utilization and Costs

In this section, we first describe the individuals included in our evaluation along with information about program-related activities. We next describe the service utilization results from the pre- and post-12-month housing periods for those participants enrolled during the evaluation period. We then present the costs associated with service utilization changes.

Descriptive Statistics of HFH Clients

As shown in Table 3.3, the average age of the clients in our sample was 51.6. Nearly 85 percent of the sample was 40 years old or over. The youngest client was 20 years old and the oldest was 95 years old. Nearly two-thirds of the sample were male, and slightly more than three-quarters of the sample were members of racial/ethnic minority groups (i.e., Black or African-American, Latino or Hispanic, Native American or Pacific Islander). Overall, 83 percent of the sample met the criteria for experiencing chronic homelessness. The mean years of homelessness experienced among the sample was 2.8 years, ranging from two months to nearly 20.5 years.

Table 3.3. Demographics, Homelessness, and Health-Related Characteristics of HFH Clients

Demographics		Health Characteristics	
Age (as of June 30, 2016) [a]		Any Physical Disabilities [a]	34.5%
18–29	5.4	Activities of Daily Living Needs [a]	4.5%
30–39	10.1	Behavioral Health Conditions (n = 429)	
40–49	17.4	Serious mental illness	71.8%
50–59	43.0	Non–serious mental illness	69.9%
60–69	21.8	Substance use disorders	22.9%
70+	2.3	Physical Health Conditions (n = 808)	
Mean Age (SD):	51.6 (11.3)	Musculoskeletal	53.1%
Gender [a]		High blood pressure	28.1%
Male	64.9%	Skin	26.6%
Female	34.9%	Diabetes	22.0%
Other	0.1%	Teeth	19.6%
Race/Ethnicity*		Neurological	17.6%
White	15.3%	Cardiovascular disease	17.0%
Asian	7.8%	Cirrhosis or gastrointestinal	16.2%
Black	44.0%	Pulmonary	15.6%
Latino	31.6%	Nutritional	9.8%
Native American	0.6%	Cancer	9.0%
Pacific Islander	0.2%	HIV	8.2%
2 or More	0.6%	Kidney disease	3.3%
Homelessness [a]		Unknown	8.3%
Chronically Homeless	83.0%	Co-occurring conditions (n = 471)	87.9%
Mean Years of Homelessness (SD)	2.8 (2.9)	Has a Medical Home [a]	95.8%
		Insurance Status	
		Medi-Cal/ Medicare/Medicaid	74.3%
		Other	8.8%
		Unknown	2.4%

[a] Denotes HFH administrative data source (otherwise from the ELP). HFH administrative data are as of November 2016, except otherwise noted. ELP data are baseline, where client is flagged with a characteristic if showing to have it between January 2010 and clients' move-in dates.
NOTES: n = 890 except where indicated. Percentages are reported unless noted otherwise.

A majority of the sample had data available on health conditions and insurance status in the ELP (n = 808 out of 890). We tallied these so that we could have information that reflects clients' conditions prior to housing. Among those for whom data were available, approximately seven out of ten were diagnosed with a serious mental illness such as schizophrenia, bipolar disorder, or had documented suicidal attempts. Twenty-three percent were diagnosed with alcohol and/or substance use disorder. In terms of physical health, the most common conditions were musculoskeletal (e.g., arthritis, back problems), high blood pressure, skin-related conditions, and diabetes. Nearly one in ten were diagnosed with cancer, and 17 percent were diagnosed with cardiovascular disease. Overall, 88 percent had at least one behavioral health illness and one physical health condition. Also, three-quarters of clients used public insurance such as Medi-Cal, Medicare, or Medicaid.

As shown in Table 3.4, over three-quarters of the sample received public assistance as of November 2016. A majority of those receiving benefits were getting General Relief (60.7 percent), followed by SSI (23.6 percent) and food stamps (13.3 percent). Additionally, approximately 44 percent of the HFH PSH recipients relied on FHSP as their rental subsidy. The other two most common subsidy types were tenant-based vouchers and project-based vouchers. The mean number of months that a client had been housed in HFH PSH as of June 30, 2016, was 21.5 months, ranging from a minimum of six days to a maximum of nearly four years.

We calculated a 12-month housing stability rate for those entering housing prior to June 30, 2015, using guidelines from the HFH program team. Stably housed was defined as housed in a stable environment, including continued living in an HFH housing unit, a higher level of care setting (e.g., a skilled nursing facility), or with family or friends. We examined how many clients were stably housed at least 365 days as of June 30, 2016. We calculated a rate as follows: the number of clients stably housed / (total number of clients – clients deceased). The 12-month housing stability rate among the sample was 96.3 percent, meeting the goals specified in the program logic model of 90 percent.

Table 3.4. Program Information on Benefits, Subsidy Type, and Housing

Benefits		Rental Subsidy Type	
Any Benefits	76.3%	FHSP	44.4%
General Relief	60.7%	TBV	29.8%
SSI	23.6%	PBV	23.4%
Food Stamps	13.3%	Shelter Plus Care	1.2%
SSDI	9.9%	None	0.6%
Employment	3.8%	Unknown	0.5%
Unemployment	1.5%	Other	0.2%
Move In		**Housing Status**	
FY Moved In		Mean Months Housed (SD)	21.5 (9.4)
2013	12.0%	12-Month Housing Stability Rate	96.3%
2014	27.8%	Among FHSP Recipients	95.9%
2015	60.2%	Among Non-FHSP Recipients	96.7%

SOURCE: DHS, HFH administrative dataset, January 6, 2017.
NOTES: SSDI = Social Security Disability Insurance. n = 890. Benefits category is not mutually exclusive; some clients receive more than one type of benefit. Information is as of November 2016, except for the 12-month housing stability rate (as of June 30, 2016). May not add up to 100 percent due to rounding.

Table 3.5 shows the distribution in months between each of the three major program milestones: (1) client completes initial application to the program; (2) ICMS staff completes an initial intake assessment; and (3) client moves into PSH. The complete process from initial application to housing took an average of 7.2 months for the sample. It took an average of 3.6 months to receive housing once clients received case management. The distribution suggests that there was substantial variation of process times for clients. The mean times were greater than the median times for all processes, indicating that a fair number of clients acquired a longer timeframe between program milestones. As expected, the median time to receipt of ICMS was slightly shorter on average than the time to housing move-in.

Table 3.6 displays this process information by the different subsidy types, that is, the local FHSP type as compared to federal subsidy types (i.e., project-based, tenant-based, and Shelter Plus Care vouchers). The time between initial application to receipt of ICMS was similar across both the FHSP and federal subsidy types. However, the time between program application to housing was on average shorter for the FHSP subsidy type (i.e., approximately six months on average) than for the federal subsidy types (i.e., approximately eight months on average).

Table 3.5. Months to Major Program Application Milestones

	Mean (Months)	Distribution (Months)					
		SD	Minimum	25th Percentile	Median	75th Percentile	Maximum
Initial Application to Housing Move-In	7.2	4.5	0.5	4.0	6.1	9.3	35.3
Initial Application to ICMS Intake	3.6	3.5	0.0	1.2	2.4	4.8	23.7
ICMS Intake to Housing Move-In	3.6	3.7	0.0	0.9	2.7	5.4	33.9

NOTES: n = 658. Unit of analysis is in months. Calculated for clients with available information for all three major application milestones. Excludes clients with lags less than zero.

Table 3.6. Months to Major Program Application Milestones

	N	Mean (Months)	SD	Distribution (Months)				
				Minimum	25th Percentile	Median	75th Percentile	Maximum
Application to Housing								
Federal	367	8.0	4.7	1.5	4.7	7.1	10.0	35.3
FHSP	284	6.1	4.0	0.5	3.5	4.9	7.7	24.5
Application to ICMS								
Federal	367	3.6	3.5	0.0	1.2	2.4	5.1	23.7
FHSP	284	3.5	3.5	0.0	1.3	2.3	4.4	22.1
ICMS to Housing								
Federal	367	4.4	4.2	0.0	0.8	4.1	6.6	33.9
FHSP	284	2.6	2.5	0.0	0.9	2.0	3.4	20.7

NOTES: n = 651. Unit of analysis is in months. Calculated for clients with available information for all three major application milestones. Excludes clients with lags less than zero.

Descriptive Analyses of Services Used

Table 3.7 shows the number and percentage of clients in the analytic sample that utilized different types of county services in the year prior to moving into HFH PSH and the year after receipt of HFH PSH. The table also displays the number and percentage of clients who accessed the same services at both time points (i.e., both pre- and post-housing). The most common health services that clients accessed one year prior to housing were outpatient medical services (75.4 percent), emergency medical services (47.6 percent), and outpatient mental health services (38.1 percent). The most common nonhealth service that clients used one year before receipt of housing was General Relief (53.5 percent). The number of clients accessing services declined

across all of these services after receipt of housing, although a nontrivial percentage of clients continued to receive services at both time. Again, considering the most common health services, 76.9 percent of outpatient medical service utilizers (n = 516), 40.6 percent of emergency service utilizers (n = 172), and nearly three-quarters of mental health outpatient services utilizers (n = 251) received the same services during both the pre- and post-housing periods.

For nonhealth services, approximately 80 percent of clients received General Relief in both the pre-housing and post-housing periods (n = 378), and 36.2 percent of clients incarcerated in the pre-housing period were incarcerated in the post-housing period (n = 25).

Fewer than 20 out of the 890 HFH clients in the analytic sample used mental health residential services, any type of substance abuse treatment, or emergency shelters. Because of this small number, we were unable to make meaningful inferences from difference of means or regression analyses for these services. Therefore, we summed up the number of days for all DMH inpatient services to collectively analyze mental health inpatient stays, and we added up the number of days for all DPH SAPC services to calculate overall days of any substance abuse treatment.

Table 3.7. Number of HFH Clients Using Services Pre-Housing and Post-Housing

	In the Year Leading Up to Housing Receipt		In the Year Following Housing Receipt		Clients Utilizing Services Across Timepoints	
	Number	Percentage of Clients	Number	Percentage of Clients	Number	Percentage of Those Receiving Services Prior to Housing Receipt
Health-Related Service Utilization						
Had Any DHS Inpatient Service	537	60.3%	308	34.6%	—	—
DHS Emergency Room	424	47.6%	253	28.4%	172	40.6%
DHS Inpatient	289	32.5%	122	13.7%	80	27.7%
DHS Outpatient	671	75.4%	556	62.5%	516	76.9%
Had Any DMH Inpatient Service	35	3.9%	19	2.1%	11	31.4%
DMH Acute Inpatient	33	3.7%	16	1.8%	10	30.3%
DMH Residential	6	0.7%	5	0.6%	1	16.7%
DMH Crisis Stabilization	74	8.3%	32	3.6%	17	23.0%
DMH Outpatient	339	38.1%	291	32.7%	251	74.0%
Any DPH SAPC Services	33	3.7%	28	3.1%	11	33.3%
DPH SAPC Residential Treatment	6	0.7%	6	0.7%	1	16.7%
DPH SAPC NTPS w/o Detox	9	1.0%	14	1.6%	8	88.9%
DPH SAPC NTPS w/Detox	6	0.7%	4	0.4%	0	0.0%
DPH Day Care Habilitative	1	0.1%	1	0.1%	0	0.0%
DPH Outpatient Treatment	16	1.8%	9	1.0%	1	6.3%
Non–Health Related Service Utilization						
General Relief	474	53.3%	392	44.0%	378	79.7%
Jail Services	69	7.8%	50	5.6%	25	36.2%
Probation Services	34	3.8%	33	3.7%	21	61.8%
LAHSA Emergency Shelter	15	1.7%	5	0.6%	0	0.0%

NOTES: n = 890.

Main Results

Impact of PSH on Service Utilization

Table 3.8 shows that when assessing the raw changes in utilization, the largest declines in health service utilization occurred in inpatient medical services (76.7 percent), emergency medical services (67.5 percent), and crisis stabilization services (59.5 percent). The number of clients also declined for these three services, as explained in Table 3.6; this suggests that the decline is due to fewer clients accessing these services. In terms of nonhealth services, months of General Relief received declined, as did days on probation, but there was a nearly threefold increase in days incarcerated. As noted in Table 3.6, there were fewer participants incarcerated during the post-housing (i.e., n = 50) than the pre-housing period (i.e., n = 69), but the number of days incarcerated increased in the post-housing period to 3.31 days, as compared to the pre-housing period of 1.16 days on average.

We tested for differences between the average service use before and after housing for each selected service utilization. This allowed to us to discover whether the changes were positive or negative and whether differences were statistically meaningful. Declines in all health service utilization, crisis stabilization use, outpatient mental health services use, General Relief use, and emergency shelter stays were statistically significant. Statistically significant increases, on the other hand, were found for incarceration.

These differences before and after housing may have occurred for a number of reasons other than the PSH program, especially since there were changes in policy during this period. Also, some of the changes may be associated with the moment that clients start receiving case management. Although this was a relatively small sample, we ran regression analyses to see if the statistically significant differences between the pre- and post-housing periods remained once we controlled for housing receipt, case management, and demographic characteristics.

Table 3.8. Pre-Post Changes Among Select Service Utilization

	Averages (Means)		Difference of Means	
	Pre-Housing	Post-Housing	Difference of Means	Percent Change
Health-Related Service Utilization Outcomes				
Frequency of DHS Emergency Room Visits	2.05	0.67	–1.38	–67.5%***
Days of DHS Inpatient Stays	6.74	1.57	–5.17	–76.7%***
Frequency of DHS Outpatient Visits	8.60	6.43	–2.17	–25.2%***
Days of DMH Inpatient Stays	0.49	0.48	–0.01	–1.8%
Frequency of DMH Crisis Stabilization Services	0.14	0.06	–0.08	–59.5%***
Frequency of DMH Outpatient Visits	7.48	5.65	–1.83	–24.5%**
Days of DPH SAPC Services	2.73	4.07	1.34	49.2%
Non–Health Related Service Utilization Outcomes				
Months of General Relief Received	4.85	4.02	–0.83	–17.1%***
Days Incarcerated	1.16	3.31	2.15	185.5%***
Days on Probation	9.29	6.57	–2.72	–29.3%
Frequency of LAHSA Emergency Shelter Stays	0.02	0.01	–0.01	–58.8%*

NOTES: n = 890. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Regression Analyses

The regression results in Table 3.9 produced similar findings to those produced by the difference-in-means analyses, except that the regression analyses suggest that PSH was not significantly associated with reductions in crisis stabilization services. Overall, we found that PSH was significantly associated with an 80-percent reduction in ER visits, a 61-percent reduction in days of medical health inpatient stays, a 47-percent reduction in medical health outpatient visits, a 44-percent reduction in mental health outpatient visits, a 28-percent reduction in General Relief receipt, and a twofold increase in days incarcerated. The reduction in ER visits was slightly greater than the ranges reported in the reviewed literature that used a similar study design, but the reduction in medical health inpatient stays were within similar ranges. The decrease in outpatient health services we observed runs counter to findings in previous studies (e.g., Culhane, Metraux, and Hadley, 2002; Basu et al., 2012; Brown et al., 2012; Toros, Stevens, and Moreno, 2012; Wright et al., 2016). It is possible that post-housing, clients chose to receive outpatient care from non-DHS facilities, and therefore utilization is not captured in our analyses.

Increases in time spent incarcerated are contrary to expectations based on previous studies. Upon a closer look, over two-thirds of the clients incarcerated post-housing were also incarcerated pre-housing (see Table 3.6). Some clients spent long periods in jail after HFH housing receipt. Specifically, 11 participants had jail stays longer than 100 days in the post-housing period, whereas during the pre-housing period, no individual had a jail stay over 100 days. HFH program staff looked at the housing patterns among those incarcerated post-housing

and found that four participants were incarcerated after moving out from HFH housing. Given that potential participants were not in jail when they were invited to apply to HFH and that clients received case management support prior to housing, jail experiences may have been muted during the pre-housing period, since participants had to be living in the community to be eligible for HFH. It is possible that policy changes, such as the implementation of Proposition 47 (enacted in November 2014), might have also influenced the length of incarceration. The proposition resulted in changes in jail stays so that those arrested and/or convicted of a non–Proposition 47 eligible offense were more likely to serve more of their sentence incarcerated than previously (Hunter et al., 2017).

Table 3.9. Regression Results for Service Utilization Outcomes

	Actual Averages		Estimated Effect of PSH	
	Pre-Housing	Post-Housing	Difference	Percentage Change
Health-Related Service Utilization Outcomes				
Frequency of DHS Emergency Room Visits	2.05	0.67	–1.64	–80.1%***
Days of DHS Inpatient Stays	6.74	1.57	–4.11	–61.0%***
Frequency of DHS Outpatient Visits	8.60	6.43	–4.05	–47.1%***
Days of DMH Inpatient Services	0.49	0.48	–0.21	–42.3%
Frequency of DMH Crisis Stabilization Services	0.14	0.06	–0.01	–5.9%
Frequency of DMH Outpatient Visits	7.48	5.65	–3.30	–44.1%***
Days of DPH SAPC Services	2.73	4.07	0.52	19.2%
Non–Health Related Service Utilization Outcomes				
Months of General Relief Received	4.85	4.02	–1.38	–28.4%***
Days Incarcerated	1.16	3.31	2.76	238.1%**
Days on Probation	9.29	6.57	–1.98	–21.3%

NOTES: Each row denotes a separate regression. Estimates are derived from Poisson GEE models that controlled for age, gender, race/ethnicity, and case management receipt. The estimated difference is the average marginal effect of PSH, and the percentage change is estimated by dividing the actual pre-housing averages by the estimated difference. n = 890. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Analysis of Expenditure Data

Descriptive Analyses

In general, the trends in expenditures correspond to the service utilization trends in that costs were higher pre- as compared to post-housing (see Tables 3.10 and 3.11). The costs were highly variable among clients, especially pre-housing. The mean value (i.e., average) exceeded the median value (i.e., the midpoint value considering the total range) for all services except for the HFH program, which suggests that the HFH clients incur substantial costs for public services. In

the case of HFH, the mean is slightly less than the median, which suggests that there were some clients that incur fewer costs than the reported average amount. Note that the distribution across some types of services revealed zero costs for many clients, as many clients did not access those type of services. As provided in the descriptive statistics, there were a few clients who relied on other subsidy sources or on none at all. In what follows, we provide the total cost for all analyzed services pre- and post-housing, and then discuss each county department's cost in some detail.

Table 3.10. Descriptive Statistics of Public Service Costs Among HFH Clients Pre-Housing

			Distribution of Costs			
Service Type	**Mean**	**SD**	**25th Percentile**	**Median**	**75th Percentile**	**Maximum**
DHS Emergency Services	$2,468	$6,651	$0	$0	$2,252	$79,971
DHS Inpatient	$25,213	$82,764	$0	$0	$10,824	$1,086,624
DHS Outpatient	$7,065	$8,610	$777	$4,250	$9,996	$63,945
DMH Inpatient	$2,640	$2,044	$0	$0	$0	$40,896
DMH Crisis Stabilization	$63	$273	$0	$0	$0	$3,751
DMH Outpatient	$1,436	$3,398	$0	$0	$1,156	$22,765
DPH SAPC Services	$132	$1,744	$0	$0	$0	$40,372
General Relief	$1,072	$1,147	$0	$442	$2,431	$2,873
Jail Services	$258	$886	$0	$0	$0	$10,734
Probation Services	$165	$900	$0	$0	$0	$6,436
Total Service Costs	**$38,146**	**$83,812**	**$5,772**	**$14,081**	**$34,791**	**$1,088,300**

NOTES: n = 890. Units of analysis are in dollars.

Table 3.11. Descriptive Statistics of Public Service Costs Among HFH Clients Post-Housing

			Distribution of Costs			
Service Type	**Mean**	**SD**	**25th Percentile**	**Median**	**75th Percentile**	**Maximum**
DHS Emergency Services	$832	$2,118	$0	$0	$1,213	$22,639
DHS Inpatient	$6,102	$28,727	$0	$0	$0	$362,874
DHS Outpatient	$5,454	$8,060	$0	$1,723	$8,260	$55,965
DMH Inpatient	$271	$2,664	$0	$0	$0	$44,361
DMH Crisis Stabilization	$26	$158	$0	$0	$0	$2,354
DMH Outpatient	$1,093	$2,839	$0	$0	$581	$30,782
DPH SAPC Services	$87	$750	$0	$0	$0	$11,296
General Relief	$889	$1,122	$0	$0	$2,210	$2,652
Jail Services	$468	$2,395	$0	$0	$0	$36,905
Probation Services	$118	$718	$0	$0	$0	$6,436

HFH Program	$15,288	$2,114	$15,513	$16,035	$16,035	$16,035
Total Service Costs	**$30,458**	**$31,307**	**$18,098**	**$22,567**	**$32,035**	**$380,737**

NOTES: n = 890. Units of analysis are in dollars. Minima are zero except for the HFH program, whose minimum is $265.39.

Overall, there was a roughly 60-percent reduction in utilization costs across six public services (see Table 3.12). Specifically, there were significant reductions in all DHS services costs, mental health outpatient services costs, and General Relief costs. The largest reductions were for DHS inpatient services (75.8 percent), DHS emergency services (66.3 percent), and crisis stabilization (59.2 percent). No significant reductions (from zero) were found for mental health inpatient services, substance use treatment services, or probation services. However, there was an 82 percent increase in jail costs (as discussed in the "Regression Analyses" section above). The percentage change for cost estimates were similar to service utilization patterns in both the regression analyses and difference-in-means analyses as reported in Tables 3.8 and 3.9. [5]

Once the direct costs of HFH services were accounted for post-housing (i.e., housing subsidy and case management services), we find that there was a 20-percent program cost offset for direct service costs for one year prior to housing versus one year after housing. This suggests that PSH expenses may be partially offset by saving other Los Angeles County funds.

[5] We conducted a sensitivity analysis where we excluded individuals whose costs exceeded the 99th percentile for any service type during the pre-housing period. We chose the 99th percentile because the 99th percentile for the highest maximum pre-housing costs for DHS inpatient services was around $230,000. This resulted in excluding about 9 percent of the sample (n = 78). The results from these analyses are shown in Appendix C. The overall percentage changes between pre- and post-housing service costs among this reduced sample were similar to the full sample (i.e., the total change in service utilization costs pre- and post-housing was 55 percent, rather than 60 percent). The largest differences between the two sets of analyses were that some of the pre-housing costs ended up being zero (particularly for DPH substance use treatment). These findings appear consistent with the idea that greater cost savings are likely to be generated from treating the individuals with the highest utilization rates.

Table 3.12. Balance Sheet for Public Services' Direct Costs Among HFH Clients Before and After Housing

	Pre-Housing	Post-Housing	Percentage Change
DHS Emergency Services	$2,196,240.00	$740,273.31	–66.3%***
DHS Inpatient	$22,439,860.00	$5,430,396.46	–75.8%***
DHS Outpatient	$6,288,059.00	$4,854,038.05	–22.8%***
DMH Acute Inpatient	$226,306.68	$235,994.40	4.3%
DMH Residential	$8,650.11	$5,551.53	–35.8%
DMH Crisis Stabilization	$56,427.94	$23,048.05	–59.2%***
DMH Outpatient	$1,277,875.51	$972,832.60	–23.9%**
DPH SAPC Residential	$98,940.97	$42,718.62	–56.8%
DPH Day Care Habilitative	$3,135.00	$2,772.00	–11.6%
DPH NTPS w/Detox	$866.21	$660.00	–23.8%
DPH NTPS w/o Detox	$13,629.22	$30,969.25	127.2%
DPH Outpatient Treatment	$525.77	$409.65	–22.1%
General Relief	$954,057.00	$791,180.00	–17.1%***
Jail Services	$238,703.70	$433,199.00	81.5%**
Probation Services	$146,654.53	$104,922.58	–28.5%
Subtotal: County Services	**$33,949,931.65**	**$13,668,965.50**	**–59.7%**
Additional HFH Services		$13,438,270.40	
Grand Total	**$33,949,931.65**	**$27,107,235.91**	**–20.2%**

NOTES: n = 890. Unit of analysis is in dollars. Two-tailed t-tests were conducted for departments' costs. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Does not include any administrative costs.

Health Functioning Survey Findings

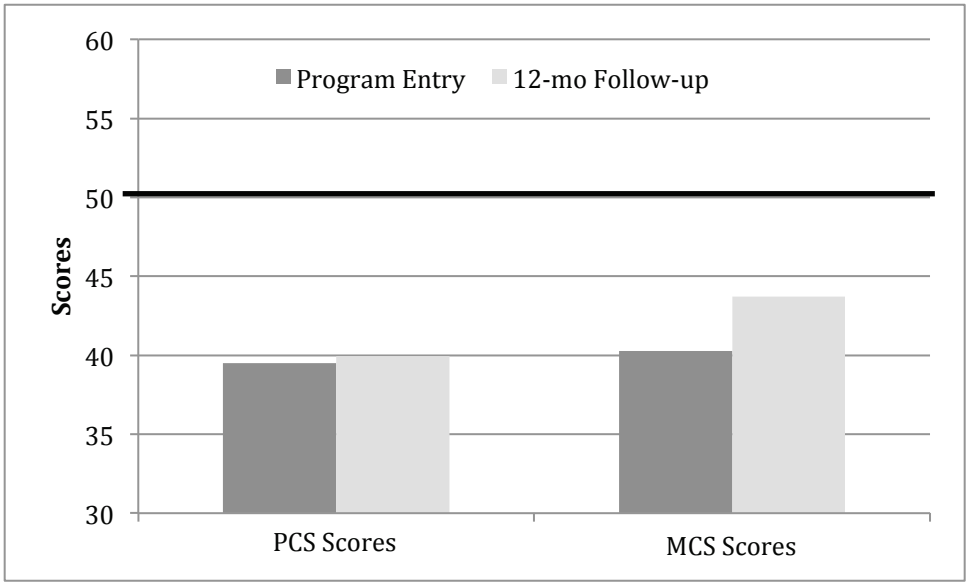
Participation

Ninety-eight new residents completed the survey at program entry. We do not know how many residents were offered the survey at housing entry. Of the 98 who completed the survey at program entry, 84 completed the follow-up survey one year later, for a response rate of 87.5 percent. 63.3 percent of the sample were from Skid Row Housing Trust, and 36.7 percent were from Step Up on Second. The follow-up sample was 69-percent male and 31-percent female. There were no differences based on agency or gender in follow-up rates. The administration modality (i.e., self-administration versus administrated by case manager) was not documented. We did not have access to any other demographic information about the participants.

Results

HFH clients' average survey responses for the two health functioning component summary scores (i.e., PCS and MCS) are presented in Figure 3.2. Regarding PCS, there was not a statistically significant change from housing entry (mean = 39.49; SD = 1.06; 95-percent confidence interval [CI] = 37.37–41.60) to one year later (mean = 39.94; SD = 1.10; 95-percent CI = 37.75–42.13; t-value (1,83) = 0.41; p-value = 0.69), with scores at housing entry and follow-up hovering about one SD below the population norm of 50. In contrast, MCS scores improved over time and the change was statistically significant (housing entry mean = 40.27; SD = 1.23; 95-percent CI = 37.83–42.72; follow-up mean = 43.73; SD = 1.21; 95-percent CI = 41.32–46.13; t-value (1, 83) = 2.64; p-value = 0.01).

Figure 3.2. Mean PCS and MCS at Program Entry and 12-Month Follow-Up



4. Key Findings, Recommendations, and Conclusions

Key Findings and Recommendations

Formative Evaluation

During initial implementation of the program, representatives from the entities responsible for providing HFH PSH services had a consistent impression about the overall goals of the program and shared understanding of their specific entity's roles and responsibilities. This finding suggests that the multiple entities involved with program delivery are likely to be successful in working collaboratively toward meeting the program goals. Logistical concerns were expressed, however, such as improving communication across the multiple departments and agencies involved with implementation and meeting the challenges that may arise with program expansion and sustainability. The many changes taking place at the county level may soon alleviate some of the concerns regarding collaboration, especially as the DHS, DPH, and DMH merge into one department. In addition, after the period of the study, HFH and the FHSP successfully expanded to serve other departments and populations (e.g., the Breaking Barriers initiative to serve individuals under community supervision). Overall, the results of the formative evaluation were optimistic: Representatives were aware of areas that might need additional attention and were forward thinking toward ways the program could be improved and sustained.

Based on these results, we offer the following recommendations:

- **With increased program expansion, HFH should consider the extent to which they can continue to engage with service providers.** There was evidence of close ties between HFH program staff and extended service providers during initial implementation; this might not be sustainable if the program scales up to serve a larger population over extended areas.
- **HFH should consider setting specific partner agency or department benchmarking goals to better monitor program partner performance.**
- **HFH should provide more specific guidance to service providers on assessment tasks.** Clients sometimes viewed assessment tasks as redundant or intrusive, which could harm enrollment rates or increase attrition. To support new specific guidance, more in-depth study of recruitment, intake, and program activities is needed.

Outcome Evaluation: Service Utilization and Costs

This evaluation provides evidence of the potential benefit of the Los Angeles County HFH PSH program in reducing costly health care utilization among individuals who formerly experienced homelessness and have complex health conditions. Even after taking into account the supportive housing program costs, there was substantial cost savings, especially in respect to the health departments. These findings provide empirical support that housing coupled with

intensive case management may reduce the use of emergency and inpatient health services among individuals that formerly experienced homelessness.

Based on these results, we make the following recommendations:

- **The program should continue, with close monitoring of the longer-term costs and benefits.** The program shows promise for serving the needs of frequent utilizers of DHS emergency and inpatient care who experience homelessness and have chronic and possibly complex health conditions.
- **Further studies should examine whether the PSH model is effective for populations other than those currently targeted by the program.** This program initially targeted individuals who were utilizing emergency and inpatient care in county hospitals and identified as experiencing homelessness. The program may have a different impact on individuals with different service-use characteristics. The literature has emphasized the need to improve understanding of what populations are best served by supportive housing approaches. Due to the high housing stability rates (96 percent) among the HFH PSH participants, it is not possible to draw definitive conclusions about that factors that predicted retention and if there are important participant characteristics to consider when identifying potential candidates for similar programs. Given that the HFH program has now provided over 3,400 housing placements and the FHSP serves other county departments and programs, future studies may be able to make better conclusions about how effective this housing model is for individuals with different characteristics and needs.
- **Increased incarceration costs due to the increased length of jail stays over time should be examined to determine how this might potentially inform recruitment and retention strategies and influence longer-term program effects.**
- **We recommend gathering data from a broader range of service providers to examine the broader societal impact of the PSH program model.** The data should include information from other Los Angeles County service providers as well as non-county service providers. Our study is limited to examining utilization among six county departments and does not include costs or savings beyond these particular service areas.

Outcome Evaluation: Health Functioning Survey

The self-reported health functioning survey scores indicated that HFH participants reported considerably lower physical and mental health functioning compared to the general population. In terms of mental health functioning, the values are similar to those noted in other studies of populations experiencing homelessness and populations that formerly experienced chronic homelessness receiving supportive housing (Chum et al., 2016; Tsai et al., 2013). Physical health functioning scores were lower than reported in other studies of populations experiencing homelessness but are in range for older populations experiencing multiple chronic conditions (Cheak-Zamora, Wyrwich, and McBride, 2009). At one year, self-reported mental health functioning improved, but still remained well below general population values. Physical health functioning scores did not show significant improvement over time and remained a SD below general population scores.

Based on the health functioning survey, we recommend the following: The program requires continued, long-term support to help improve participants' physical health. Though the program has been successful in identifying and recruiting participants that have severe chronic health conditions and may need supportive services provided by this program, these conditions can seldom be remedied in the short term.

Conclusions

The HFH PSH program was designed to provide long-term affordable housing coupled with case management for individuals identified as experiencing homelessness and frequent users of county medical health services. RAND's evaluation of the first individuals housed before July 2015 showed that the program has been successful in stably housing over 96 percent of participants. Time to receipt of housing was on average a little over six months. Examination of county service utilization and costs across six departments showed an overall reduction from one year prior to housing as compared to one year after housing, especially in regard to inpatient and emergency health care. The findings from this study demonstrate that a PSH program that targets individuals who experience homelessness and are frequent utilizers of county health may offset the costs of the program in Los Angeles County.

Appendix A. Comparisons of Cost Studies' Results

Table A.1. RCTs Outside Los Angeles County

Reviewed Project/Paper	Geographic Area	Target Population	Study Design	Analytic Approach	Findings	
					Service Utilization	Cost
At Home/ Chez Soi Project (Stergiopoulos et al., 2015)	Multiple sites (Vancouver, Winnipeg, Toronto, and Montreal, Canada)	Adults experiencing homelessness and with mental health disorder(s) not currently receiving assertive community treatment or intensive case management at time of enrollment (n = 1,198)	• Pre-post evaluation (baseline, and quarterly up to 24 months post enrollment) • Comparison groups: ICMS recipients versus Assertive Community Treatment (ACT) recipients	Linear mixed models DD: GEE regression models Cost analysis—societal perspective	On average, treated group had higher numbers of participants hospitalized more than once relative to control group in 3 out of the 4 study sites**	• Total PSH w/ICMS costs: 14,177 Canadian dollars per tenant per year ($10,761.35 U.S. dollars) • Total PSH w/ACT costs: 22,257 Canadian dollars per tenant per year ($16,894 U.S. dollars) Compared with the usual care model (ACT), the supportive housing with ICMS costs approximately 30% less, and resulted in average cost reduction of 4,849 Canadian dollars per tenant per year ($3,678.99 U.S. dollars)
Pathways to Housing (Tsemberis, Gulcur, and Nakae, 2004)	New York City	Individuals experiencing homelessness with mental health disorder(s) (n = 225)	• Pre-post evaluation (baseline, and biannually up to 24 months) • Comparison group: approach-as-usual recipients versus high-frequency approach recipients • Control group was oversampled to account for study attrition given nature of homelessness	Difference in means: repeated-measures analysis of variance and t-tests with Bonferroni adjustments	High-frequency treated group had significantly greater usage of substance abuse outpatient treatment services than approach-as-usual control group	

Reviewed Project/Paper	Geographic Area	Target Population	Study Design	Analytic Approach	Findings	
					Service Utilization	Cost
2 hospitals (Sadowski et al., 2009)	Chicago	Individuals experiencing homelessness with chronic medical conditions (n = 407)	• Pre-post evaluation (baseline, and quarterly up to 18 months post housing) • Comparison group: PSH recipients versus patients subject to "usual care"	DD: Zero-inflated negative binomial regression models	Compared to the control group post-period, the treated group had rate reductions over 18-month period of: • 29% for hospitalizations • 29% for hospital days*** • 24% for ER visits**	
2 hospitals (Basu et al., 2012)	Chicago	Individuals experiencing homelessness with chronic medical conditions (n = 407)	• Pre-post evaluation (baseline, and quarterly up to 18 months post housing) with propensity score weighting • Comparison group: PSH recipients versus patients subject to "usual care"	Cost analysis—societal perspective using two-tailed t-tests	Compared to the control group post-period, the treated group had per year: • 23% fewer days in hospital* • 33% fewer ER visits** • 68% fewer days in substance abuse residential treatment*** • 42% fewer nursing home days* • 77% more medical and mental health outpatient visits per year***	• Post-placement public service costs for control group: $36,296 for usual care per year • Post-placement public service costs for treated group: $26,652 for PSH tenants per year • Total program costs for control group (housing and case management): $1,210 for usual care per year • Total program costs for treated group (housing and case management): $4,547 for PSH tenants per year

NOTE: DD = difference-in-difference regression analysis. * = p < 0.1; ** = p < 0.05; *** = p < 0.01.

Table A.2. PSM Studies Outside Los Angeles County

Reviewed Project/Paper	Geographic Area	Target Population	Study Design	Analytic Approach	Findings	
					Service Utilization	Cost
NY/NY I Housing First Program (Culhane, Metraux, and Hadley, 2002)	New York City	Individuals experiencing homelessness and have severe mental health disorder(s) (n = 4,679)	• Quasi-experimental design • Pre-post evaluation with PSM control group (two years pre, two years post) • Comparison group: placed versus non-NY/NY I matched participant	Difference of means: paired-comparison t-tests DD: GEE regression models with PSM	Compared to the control group post-period, the treated group had rate reductions [over a two-year period] in the following: • 60.5% for shelter use days*** • 49.2% for OMH hospital days*** • 21.2% for HHC hospital days*** • 24.4% for Medicaid hospital days*** • 75.9% for number of outpatient visits*** • 84.8% for state incarceration days*** • 38% for NYC jail days***	• Pre-placement costs for public services (including health services): $40,449 per person per year (in 1999 dollars) • Reduction in public service costs, post-placement: $16,282 per housing unit per year • Program costs: $17,277 per housing unit per year • Net cost for placed persons: $995 per housing unit per year
NY/NY III Housing First Program (Seligson et al., 2013)	New York City	Individuals and heads of households who are experiencing chronic homelessness or at risk of experiencing homelessness, and have complex medical and behavioral conditions, or who are transitional-aged youth (n = 12,726)	• Quasi-experimental design • Pre-post evaluation with PSM (baseline, 12-months post housing) • Comparison group: placed individuals versus matched individuals not placed	Weighted means with PSM and bootstrapping	Treated group spent significantly less days in institutions (jails, homeless, and state-operated psychiatric facilities), and were less likely to have at least one medical hospitalization than control group	• Post-placement public service costs for control group: $51,020 per unplaced per year (in 2011 dollars) • Post-placement public service costs for treated group: $23,355 per placed per year • Total program costs: $17,566 per placed per year (Cost savings were statistically significant)

Reviewed Project/Paper	Geographic Area	Target Population	Study Design	Analytic Approach	Findings	
					Service Utilization	Cost
1811 Eastlake Housing First Program (Larimer et al., 2009)	Seattle	Individuals who are experiencing chronic homelessness, have severe alcohol use problems, and who are the most frequent users of local crises services (n = 134)	• Quasi-experimental design • Pre-post evaluation with PSM control group (one year pre-enrollment, and quarterly up to one year postenrollment) • Comparison group: housing recipients versus wait-listed applicants	DD: GEE Poisson regression models with propensity score adjustments		• Pre-placement health care costs per control individual: $39,816 per wait-listed per year • Post-placement health care costs per control individual: $23,184 per wait-listed per year • Pre-placement health care costs per treated individual: $48,972 per tenant per year • Post-placement health care costs per treated individual: $17,904 per tenant per year • Program costs (housing and services): $13,440 per tenant per year • Average cost rate reduction of 53% for housed participants relative to those who were wait-listed in first 6 months** • Average service cost reductions at 6 months for participants relative to wait-listed was $29,388 per person per year after accounting for housing program costs

NOTE: * = p < 0.1; ** = p < 0.05; *** = p < 0.01.

Table A.3. One Group Pre-Post Outside Los Angeles County

Reviewed Project/Paper	Geographic Area	Target Population	Study Design	Analytic Approach	Findings	
					Service Utilization	Cost
Bud Clark Commons Housing First Program (Wright et al., 2016)	Portland, OR	Individuals who formerly experienced homelessness and have complex medical and mental health issues and moved into Bud Clark Commons' supportive housing complex between 2010–2014 (n = 98; Medicaid participants, n = 58)	• One-group pre-post evaluation (one year pre, one year post) • Note: participants were not selected at random; at single site	Pilot Difference of means: two-tailed t-tests DD: GEE regression models (costs)	Among Medicaid participants: • Average number of primary care visits increased by 7%* • Average number of outpatient mental health visits increased by 6%* • Average number of ER visits decreased by 43%* • Average hospital days decreased by 23%*	Among Medicaid participants: • Pre-placement health care costs: $19,512 per Medicaid-covered tenant per year* • Post-placement health care costs: $10,788 per Medicaid-covered tenant per year* • Supportive housing cost: $11,600 per tenant per year
Direct Access to Housing (Bamberger and Dobbins, 2014)	San Francisco	Seniors who experienced homelessness (n = 51)	• Quasi-experimental design • One-group pre-post evaluation (one year pre, seven years post) • Made comparisons: tenants placed from SNFs versus tenants placed from general community	Difference of means: Two-tailed, chi-squared, and Fisher's exact tests	Average SNF days reduced by 18%	• Pre-placement hospital-based health care costs: $33,538 per tenant per year • Average program costs (rent, day health services, hospital-based care): $23,810 per tenant per year • Days reduced in SNF saved Medicaid and Medicare $109,524 per SNF tenant per year
Moore Place Housing First Program (Thomas et al., 2014)	Charlotte, NC	Adults who have experienced chronic homelessness and have behavioral or health issues (which may include developmental disabilities) (n = 73)	• Quasi-experimental design • One-group pre-post evaluation (baseline, 1 year post housing)	Difference of means: two-tailed t-tests Content theme analysis	• 25% increase in income (SSI and SSDI)** • 78% reduction in ER visits*** • 79% reduction in hospitalizations*** • 78% reduction in arrests** • 84% reduction in days in jail**	• Pre-placement hospital-based health care costs: $41,542 per tenant per year • Post-placement hospital-based health care costs: $12,472 per tenant per year

Reviewed Project/Paper	Geographic Area	Target Population	Study Design	Analytic Approach	Findings	
					Service Utilization	Cost
Preble Street and Shalom House, Inc. (Mondello et al. 2007)	Portland, ME	Individuals who have experienced homelessness or chronic homelessness (both as defined by HUD) and have complex health issues or disabilities (n = 99)	• Quasi-experimental design • One-group pre-post evaulation (one year pre, one year post)	Difference of means: Descriptive only (no statistical tests) Content theme analysis	• Shelter use decreased by 98% • Ambulance use decreased by 60% • ER visits decreased by 52% • Police contacts decreased by 68% • Days in jail decreased by 62% • Hospitalizations decreased by 77% • Psychiatric hospitalizations decreased by 38% • Substance abuse treatment increased by 22% • Transportation use increased by 270%	• Pre-placement public service costs of services (including health services): $28,045 per tenant per year • Post-placement public service costs of services (including health services): $14,009 per tenant per year • Total program costs: $13,092 per tenant per year
Project 25 (Reaser and Mauerman 2015)	San Diego	Individuals who have experienced homelessness and who most frequently used at least two of the following public services: jail; ER, ambulance or hospitalization; and County mental health services (n = 28)	• Pilot • One-group pre-post evaluation (one year pre, one year post and two years post) • Note: selection of participants were not randomized; heaviest users of services (top 25 out of 71 costliest) selected to be in program	Difference of means: Descriptive only (no statistical tests)	• Average hospitalizations decreased by 80% • Average hospital days decreased by 63% • Average ER visits decreased by 76% • Average arrests decreased by 67% • Average incarceration days decreased by 64% • Average ambulance rides decreased by 77% • Average supportive services (i.e., crisis house, detox centers, homeless shelters, legal assistance, etc.) decreased by 40% • SSDI/SSI establishment increased by 32%	• Pre-placement public service costs (ambulance, arrests, ER visits, hospitalization, incarceration, other): $142,943 per tenant per year • Post-placement public service costs: $48,793 per tenant per year • Total program costs: $27,742 per tenant per year

Reviewed Project/Paper	Geographic Area	Target Population	Study Design	Analytic Approach	Findings	
					Service Utilization	Cost
PSH program in Knoxville, Tenn. (Brown et al. 2012)	Knox County, TN	Adults who have experienced chronic homelessness in Knox County for at least one year (n = 41)	One-group pre-post evaulation (one year pre, one year post)	Difference of means: Descriptive only (no statistical tests)	• Average ER visits decreased by 33% • Average arrests decreased by 67% • Average days in jail decreased by 87% • Average EMS increased by 100% • Average supportive services (i.e., bus passes, laundry, drop-in centers, baggage check-in, phone services, etc.) decreased by 78% • Average mental health outpatient visits increased by 33%	• Pre-placement costs for public services (including health): $16,322 per tenant per year • Post-placement costs for public services (including health): $17,145 per tenant per year • Total program costs (housing): $3,531 per tenant per year • Pre-placement costs for public services when outliers are excluded: $9,681 per tenant per year • Post-placement costs for public services when outliers are removed: $4,645

NOTE: * = p < 0.1; ** = p < 0.05; *** = p < 0.01.

Table A.4. Studies in Los Angeles County

Reviewed Project/Paper	Target Population	Study Design	Analytic Approach	Findings	
				Service Utilization	Cost
Frequent Users Systems Engagement (FUSE) Pilot: 10th Decile Project (Flaming et al., 2013)	Individuals who experienced homelessness and who rank in the top 10 percentile in public and hospital costs (n = 212)	• Quasiexperimental design • One-group pre-post evaluation for utilization (one year pre, one year post) • Pre-post evaluation with PSM control group for costs (one year pre, one year post) • Comparison group: 10th decile clients versus non-10th decile matched clients	Difference of means	Treated group had per year: • 71% less days in ER visits • 81% less days in inpatient services	• Pre-program public service costs (including hospital) for treated group: $63,808 per person per year • Post-program public service costs (including hospital, excluding housing subsidy) for treated group: $16,913 per person per year • Pre-program health care costs for treated group: $58,962 per person per year • Pre-program health care costs for treated group: $16,474 per person per year • One-time and first-year program costs: $15,159 per person • Program rental costs in subsequent years: $3,518 per person per year • Program supportive service costs in subsequent years: $3,000 per person per year
Project 50 (Toros, Stevens, and Moreno, 2012)	Individuals who experienced homelessness in the Skid Row area of Los Angeles and have the highest vulnerability scores per Common Ground Vulnerability Index (n = 96)	• Quasiexperimental design • Pre-post evaluation with PSM control group (two years pre, two years post) • Ethnographic observation and interviews • Comparison group: non–Project 50 clients with similar demographics but on lower vulnerability scale	Cost analysis–county perspective DD: Difference of means using PSM Content theme analysis	Compared to the control group post-period, the treated group had per year: • 32% less days in jail • 13% less days in inpatient and emergency services • 55% less days in substance abuse residential treatment 128% more days in mental health treatment	• Pre-program public service costs for control group: $41,279 per housing unit per year • Post-program public service costs for control group: $49,830 per housing unit per year • Pre-program public service costs for treated group: $40,758 per housing unit per year • Post-program public service costs for treated group: $25,285 per housing unit per year • Total service cost reductions for first year: $24,024 per housing unit per year

Reviewed Project/Paper	Target Population	Study Design	Analytic Approach	Findings	
				Service Utilization	Cost
Skid Row Collaborative ("Where We Sleep") (Flaming, Burns, and Matsunaga, 2009)	Single adults who experienced homelessness (n = 10,193) Study subgroups: • Skid Row Housing Trust's current and former clients (n = 1,007) • Individuals experiencing homelessness and receiving General Relief (n = 9,186)	• Pre-post evaluation • Sets of comparisons: (a) pre-post without control groups; (b) comparison group via similar attributes (i.e., age, gender, disability status); (c) comparison group via PSM control group	Difference of means Cost analysis		• Post-program public service costs for homeless individuals not in PSH: $34,764 per person per year (in 2008 dollars) • Post-program public service costs for homeless individuals in PSH: $7,260 per person per year (in 2008 dollars) • Total program costs: $13,224 per person per year
The Services Homeless Single Adults Use and Their Associated Costs (Wu and Stevens, 2016)	Single adults residing in Los Angeles County who experienced homelessness (n = 148,815)	Descriptive study	Cost analysis—county perspective Descriptive analyses		L.A. County spent $965 million on health services, public assistance, and criminal justice services/law enforcement among homeless single adults. This amounts to $6,451 per homeless single adult per year

Appendix B. Interview Protocol

Abbreviations:

- HFH = Housing for Health
- FHSP = Flexible Housing Subsidy Pool

Participants: HFH and partnering agencies personnel including those who oversee FHSP or work with FHSP recipients as well as with clients who are receiving traditional rental subsidies (i.e., Section 8). Overall, we intend to invite the following key informants: program managers, program directors, social workers, and intensive case management staff.

NOTE THAT ALL INSTRUCTIONS IN CAPS OR ITALICS ARE NOT TO BE READ TO RESPONDENTS.

INTRODUCTION

Thank you for taking the time to talk with us today about the Housing for Health program [and the Flexible Housing Subsidy Pool]. We will ask you questions about your understanding of the Housing for Health program [as well as the Flexible Housing Subsidy Pool], and the ways in which the program is being implemented and evaluated.

We received your name and contact information from HFH's Program Manager Corrin Buchanan.

VERBAL CONSENT

I work for RAND, which is a non-profit research organization. Our discussion today is part of a project by RAND in partnership with the County's Department of Health Services and Brilliant Corners funded by the Hilton Foundation. Today, we want to find out roles, responsibilities, activities, and expected program outcomes since you and your agency starting working with the Housing for Health program.

Before we begin, I want to assure you that your responses to our questions are held in strict confidence. We will not attribute comments to specific individuals or include names of people we speak with in any of our reports. Even though we will not attribute interview responses to individuals in our reports, there is a chance of identification by inference because the number of persons we are interviewing from each agency type is small. So please do not say anything that you would not want to be attributed back to you or your agency, because we cannot guarantee readers couldn't identify respondents by inference.

Your participation in this interview is voluntary. You may choose not to participate, decline to answer any question, or stop the interview at any time. The interview will take approximately 60 minutes.

I plan to audio record it, solely for our note taking purposes. The audio recording will only be used by project staff, and we'll destroy it when the project is done.

Lastly, we have shared with you our contact information as well as contact information to RAND Corporation's Human Subjects Committee. If any questions or concerns arise after the interview, please do not hesitate to contact any of the following on this contact sheet.

Do I have your permission to proceed with the interview?

[IF NO:] Thank you anyway.

[IF YES:] Do I also have your permission to audio record the interview?

Do you have any questions before we begin? [*Answer any questions and then proceed to interview.*] [*Please turn recorder on*]

INTERVIEW QUESTIONS

ROLE AND RESPONSIBILITIES IN RELATION TO HFH'S PERMANENT SUPPORTIVE HOUSING PROGRAM

I want to emphasize that there are no wrong or right answers here; we just want to get the most accurate picture of how things work in your agency in relation to the Housing for Health program.

1. I'd like to start by asking you what your job title is and to summarize your involvement with HFH [FSHP].
2. In a sentence or two, could you please given me an overview of your agency? I'm thinking of things like it type, size, and what clients you serve, and range of services the agency provides.
3. How long have you personally and how long has your agency been working on HFH [FHSP program]? What portion of your time is dedicated to HFH [FHSP] administration?
4. How many staff at your agency are involved in HFH [FHSP]?
5. Can you tell me in detail what services you and your agency provide in regard to HFH? What's your role and can you describe the entire set of services your agency provides in regard to executing the program.
6. Do you know approximately how many individuals have been served by your agency under the HFH program?
7. How is your agency compensated for its services, if at all, to the HFH [FHSP] program (e.g., stipend for $X amount, % of time covered equating to $X amount, payment per client served)?
8. Has your agency's participation in HFH changed over time? If so, how and why?

PROGRAM EFFECTS

We would now like to ask you about goals and the subsequent outcomes that are expected from participation in the Housing for Health program.

Ask service providers the following:

9. First, what do you perceive to be the goals of the Housing for Health program, and the goals of the Flexible Housing Subsidy Pool?
10. What changes do you expect or hope to see because of the program at the client-level? What changes in behavior or performance might you expect to see in your clients? *Probe about health status and well-being, housing retention, or service utilization*.
11. What changes may occur at the organizational-level because of the program? (i.e. service capacity, better trained staff, improved staff-relation clients, etc.) How might this impact changes at the client-level?
12. What economic outcomes do you think the program can have on the community-level? *Probe about any cost savings, or any reductions in substance use for example*.
13. Did you have any specific outcomes or benchmarking goals in mind for the program? (i.e., have a housing retention rate of 86 percent in an 18-month period, or have decreased average costs per occupied housing unit for all services by 60 percent in a three-year period)

Ask department staff the following:

14. What effects do you think the program might have on clients? What changes in behavior or performance might you expect to see in your clients? *Probe about health status and well-being, housing retention, or service utilization*.
15. What economic outcomes could the program can have on the county-level? *Probe about any cost savings, or any reductions in substance use for example*.
16. What specific changes could the program have at the system-level? What policies or legislative impact could this program have at the county-level or even state-level? What political impacts could the program have if it was successful? Unsuccessful? (i.e. more funding toward homelessness initiatives, more stringent regulation in favor or in greater interest of homeless individuals, etc.)
17. Did you have any specific outcomes or benchmarking goals in mind for the program? (i.e., have a housing retention rate of 86 percent in an 18-month period, or have decreased average costs per occupied housing unit for all services by 60 percent in a three-year period)

Ask all

18. What's your sense of the uniqueness of HFH [FHSP]? Do you think it's one of a kind among city government, and if so, why?
19. Are there particular lessons learned thus far in the administration and design of HFH [FHSP]? If so, what are some of these lessons, and is the program going to be adjusted as a consequence?
20. Do you think particular aspects of the HFH [FHSP] program that are particularly effective or not particularly effective? For example, scattered site vs. project-based units, certain funding streams better or less well suited for the types of clients to be served, types of case management, and types of assistance provided such as medical transportation? If so, what effects do you think they have?

ANTICIPATED CHALLENGES OR OTHER FACTORS THAT MAY INFLUENCE PROGRAM PIECES

Now we would like to ask you about any anticipated challenges or other factors that may influence the program in the future.

21. Looking down the road for HFH [FHSP], what do you think are particular threats, if any, to its continued implementation and expansion?

    Probes: funding, growing pains, County/City collaboration, mission drift, capacity of non-profits to provide case management, political will, community opposition to locating housing in communities for formerly homeless people
22. Is there any significant legislation that may impact this program or this evaluation (i.e. the Home for Good plan)? If so, which ones and how?
23. Is there anything else that you think we should know about for the evaluation that we did not ask you about?

Appendix C. Sensitivity Results

Table C.1. Balance Sheet for Public Services' Direct Costs Among HFH Clients Before and After Housing Excluding Outliers

	Pre-Housing	Post-Housing	Percentage Change
DHS Emergency Services	$1,547,247.00	$591,470.10	–61.8%
DHS Inpatient	$15,700,711.00	$4,361,073.21	–72.2%
DHS Outpatient	$5,439,609.00	$4,319,895.61	–20.6%
DMH Acute Inpatient	$51,981.60	$54,677.88	5.2%
DMH Residential	—	$1,201.74	0.0%
DMH Crisis Stabilization	$32,572.27	$14,095.50	–56.7%
DMH Outpatient	$977,192.27	$770,622.75	–21.1%
DPH SAPC Residential	—	$24,029.31	—
DPH Day Care Habilitative	—	$2,772.00	—
DPH NTPS w/Detox	—	$308.00	—
DPH NTPS w/o Detox	—	$6,785.53	—
DPH Outpatient Treatment	$214.89	$288.69	34.3%
General Relief	$853,502.00	$705,653.00	–17.3%
Jail Services	$158,252.48	$343,771.70	117.2%
Probation Services	$83,043.60	$60,708.21	–26.9%
County Services	$24,844,326.12	$11,257,353.24	–54.7%
HFH Services		$12,283,316.64	
Grand total	**$24,844,326.12**	**$23,540,669.88**	**–5.2%**

NOTE: n = 812.

References

Abt Associates, "Flexible Housing Subsidy Pool Brief Evaluation of the Conrad N. Hilton Foundation Chronic Homelessness Initiative," 2017. As of April 28, 2017: http://www.abtassociates.com/reports/2017/flexible-housing-subsidy-pool-brief-evaluation-of.aspx

Baggett, Travis P., James J. O'Connell, Daniel E. Singer, and Nancy A. Rigotti, "The Unmet Health Care Needs of Homeless Adults: A National Study," *American Journal of Public Health,* Vol. 100, No. 7, July 2010, pp. 1326–1333. As of September 29, 2017: https://www.ncbi.nlm.nih.gov/pubmed/20466953

Bamberger, Joshua D., and Sarah Dobbins, *Long-Term Cost Effectiveness of Placing Homeless Seniors in Permanent Supportive Housing*, San Francisco, Calif.: Federal Reserve Bank of San Francisco, 2014. As of August 29, 2014: http://www.frbsf.org/community-development/publications/working-papers/2014/july/long-term-cost-effectiveness-homeless-seniors-permanent-supportive-housing/

Basu, Anirban, Romina Kee, David Buchanan, and Laura S. Sadowski, "Comparative Cost Analysis of Housing and Case Management Program for Chronically Ill Homeless Adults Compared to Usual Care," *Health Services Research,* Vol. 47, No. 1, Pt. 2, February 2012, pp. 523–543. As of October 2, 2017: https://www.ncbi.nlm.nih.gov/pubmed/22098257

Brown, Kathleen, Michael Dunthorn, Alicia Mastronardi, David Patterson, Steven Stothard, Roberta Strum, and Stacia West, *Comparative Costs and Benefits of Permanent Supportive Housing in Knoxville, Tennessee*, Knoxville, Tenn.: City of Knoxville, Knox County Health Department Epidemiology Program, and the University of Tennessee College of Social Work—KnoxHMIS, 2012.

Byrne, Thomas, Stephen Metraux, Manuel Moreno, Dennis P. Culhane, Halil Toros, and Max Stevens, "Los Angeles County's Enterprise Linkages Project: An Example of the Use of Integrated Data Systems in Making Data-Driven Policy and Program Decisions," *California Journal of Politics and Policy,* Vol. 4, No. 2, 2012, pp. 95–112.

California Legislative Information, "House Resolution No. 56," 2016. As of June 14: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160HR56

Cheak-Zamora, Nancy C., Kathleen W. Wyrwich, and Timothy D. McBride, "Reliability and Validity of the SF-12v2 in the Medical Expenditure Panel Survey," *Quality of Life Research,* Vol. 18, No. 6, 2009, pp. 727–735.

Chum, Antony, Anna Skosireva, Juliana Tobon, and Stephen Hwang, "Construct Validity of the SF-12v2 for the Homeless Population with Mental Illness: An Instrument to Measure Self-Reported Mental and Physical Health," *PloS One,* Vol. 11, No. 3, 2016, p. e0148856.

Culhane, Dennis P., Stephen Metraux, and Trevor Hadley, "Public Service Reductions Associated with Placement of Homeless Persons with Severe Mental Illness in Supportive Housing," *Housing Policy Debate,* Vol. 13, No. 1, 2002, pp. 107–163.

Curnan, Susan, Lisa LaCava, Dianna Sharpstee, Mark Lelle, and Michelle Reece, *W.K. Kellogg Foundation Evaluation Handbook*, Battle Creek, Mich.: W.K. Kellogg Foundation, 2004. As of June 13, 2017: https://www.wkkf.org/resource-directory/resource/2010/w-k-kellogg-foundation-evaluation-handbook

DHS—*See* Los Angeles County Department of Health Services.

DPH—*See* Los Angeles County Department of Public Health.

Elixhauser, A., C. Steiner, and L. Palmer, *Clinical Classifications Software (CCS)*, Rockville, Md.: U.S. Agency for Healthcare Research and Quality, 2015. As of September 29, 2017: http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp

Flaming, Daniel, Patrick Burns, and Michael Matsunaga, *Where We Sleep: Costs When Homeless and Housed in Los Angeles*, Los Angeles, Calif.: Economic Roundtable, June 13, 2009. As of September 29, 2017: http://www.lampcommunity.org/ckeditor/userfiles/images/1380324155_Where_We_Sleep_Costs_When_Homeless_and_Housed_in_Los_Angeles.pdf

Flaming, Daniel, Susan Lee, Patrick Burns, and Gerald Sumner, *Getting Home: Outcomes from Housing High Cost Homeless Hospital Patients*, Los Angeles, Calif.: Economic Roundtable, 2013.

Gugiu, P. Cristian, and Liliana Rodriguez-Campos, "Semi-Structured Interview Protocol for Constructing Logic Models," *Evaluation and Program Planning,* Vol. 30, No. 4, November 2007, pp. 339–350. As of September 29, 2017: https://www.ncbi.nlm.nih.gov/pubmed/17905433

Hamai, Sachi A., *Initial Results from the ELP-HMIS Data Integration Project (September 30, 2015)*, Los Angeles, Calif.: Los Angeles County–Chief Executive Office, 2015.

Health Services Los Angeles County, "Housing for Health," undated. As of October 3, 2017: https://dhs.lacounty.gov/wps/portal/dhs/housingforhealth

Hunter, Sarah B., Lois M. Davis, Rosanna Smart, and Susan Turner, *Impact of Proposition 47 on Los Angeles County Operations and Budget*, Santa Monica, Calif.: RAND Corporation,

RR-1754-LAC, 2017. As of September 29, 2017: https://www.rand.org/pubs/research_reports/RR1754.html

Hwang, Stephen W., Catharine Chambers, Shirley Chiu, Marko Katic, Alex Kiss, Donald A. Redelmeier, and Wendy Levinson, "A Comprehensive Assessment of Health Care Utilization Among Homeless Adults Under a System of Universal Health Insurance," *American Journal of Public Health*, Vol. 103, Suppl. 2, December 2013, pp. S294–301. As of September 29, 2017: https://www.ncbi.nlm.nih.gov/pubmed/24148051

Kertesz, Stefan G., Travis P. Baggett, James J. O'Connell, David S. Buck, and Margot B. Kushel, "Permanent Supportive Housing for Homeless People—Reframing the Debate," *New England Journal of Medicine,* Vol. 375, No. 22, December 1, 2016, pp. 2115–2117.

Larimer, Mary E., Daniel K. Malone, Michelle D. Garner, David C. Atkins, Bonnie Burlingham, Heather S. Lonczak, Kenneth Tanzer, Joshua Ginzler, Seema L. Clifasefi, William G. Hobson, and G. Alan Marlatt, "Health Care and Public Service Use and Costs Before and After Provision of Housing for Chronically Homeless Persons with Severe Alcohol Problems," *JAMA,* Vol. 301, No. 13, 2009, pp. 1349–1357. As of September 2, 2014: http://www.ncbi.nlm.nih.gov/pubmed/19336710

Larson, Celia O., "Use of the SF-12 Instrument for Measuring the Health of Homeless Persons," *Health Services Research,* Vol. 37, No. 3, 2002, pp. 733–750.

LAHSA—*See* Los Angeles Homeless Services Authority.

Los Angeles County Department of Health Services, *Bringing Housing to Scale: Housing for Health Progress Report*, Los Angeles, Calif., 2017.

Los Angeles County Department of Health Services, Housing for Health Division, and Brilliant Corners, *Flexible Housing Subsidy Pool: Policies and Procedures Manual*, Los Angeles, Calif.: Los Angeles County Department of Health Services, 2014a.

———, *HFH Process Map*, Los Angeles, Calif.: Los Angeles County Department of Health Services, 2014b.

———, Housing for Health administrative dataset, January 6, 2017.

Los Angeles County Department of Public Health, "Social Determinants of Health: Housing and Health in Los Angeles County," 2015. As of September 7, 2017: http://publichealth.lacounty.gov/ha/reports/LAHealthBrief2011/HousingHealth/SD_Housing_Fs.pdf

Los Angeles Homeless Services Authority, *Greater Los Angeles Homeless Count, Data Summaries—Los Angeles Continuum of Care*, Los Angeles, Calif., 2016. As of July 8, 2016: https://documents.lahsa.org/Planning/homelesscount/2016/datasummaries/CoC.pdf

———, "2017 Greater Los Angeles Point-In-Time Count," 2017. As of June 14, 2017: http://www.lahsa.org/homeless-count/

Ly, Angela, and Eric Latimer, "Housing First Impact on Costs and Associated Cost Offsets: A Review of the Literature," *Canadian Journal of Psychiatry,* Vol. 60, No. 11, 2015, pp. 475–487.

Mondello, Melany, Anne B. Gass, Thomas McLaughlin, and Nancy Shore, *Cost of Homelessness: Cost Analysis of Permanent Supportive Housing*, Augusta, Me.: Corporation for Supportive Housing, Maine Housing, and Maine Department of Health and Human Services, 2007. As of June 13, 2017: http://shnny.org/uploads/Supportive_Housing_in_Maine.pdf

National Health Care for the Homeless Council, *Homelessness & Health: What's the Connection?* Nashville, Tenn., September 7, 2011. As of October 2, 2017: http://www.nhchc.org/wp-content/uploads/2011/09/Hln_health_factsheet_Jan10.pdf

O'Hara, Ann, "Housing for People with Mental Illness: Update of a Report to the President's New Freedom Commission," *Psychiatric Services,* Vol. 58, No. 7, July 2007, pp. 907–913.

Padgett, Deborah, Benjamin F. Henwood, and Sam J. Tsemberis, *Housing First: Ending Homelessness, Transforming Systems, and Changing Lives*, New York, N.Y.: Oxford University Press, 2015.

Reaser, Lynn, and Dieter Mauerman, *Project 25: Housing the Most Frequent Users of Public Services*, San Diego, Calif.: Point Loma Nazarene University, Fermanian Business and Economic Institute, 2015. As of June 13, 2017: http://uwsd.org/files/galleries/Project_25_Report.pdf

Riley, Elise D., Monica Gandhi, C. Bradley Hare, Jennifer Cohen, and Stephen W. Hwang, "Poverty, Unstable Housing, and HIV Infection Among Women Living in the United States," *Current HIV/AIDS Reports,* Vol. 4, No. 4, 2007, pp. 181–186. As of October 2, 2017: http://dx.doi.org/10.1007/s11904-007-0026-5

Sadowski, Laura S., Romina A. Kee, Tyler J. VanderWeele, and David Buchanan, "Effect of a Housing and Case Management Program on Emergency Department Visits and Hospitalizations Among Chronically Ill Homeless Adults: A Randomized Trial," *JAMA,* Vol. 301, No. 17, 2009, pp. 1771–1778. As of October 2, 2017: http://www.ncbi.nlm.nih.gov/pubmed/19417194

Seligson, A. Levanon, S. Lim, T. Singh, E. Laganis, E. Stazesky, S. Donahue, C. Lanzara, T.G. Harris, T. Marsik, C.M. Greene, F.R. Lipton, R. Myers, and A.M. Karpati, *New York/New York III Supportive Housing Evaluation: Interim Utilization and Cost Analysis*, New York, N.Y.: New York City Department of Health and Mental Hygiene, New York City Human Resources Administration and New York State Office of Mental Health, 2013. As of June 13, 2017: https://shnny.org/images/uploads/NY-NY-III-Interim-Report.pdf

Stergiopoulos, Vicky, Stephen W. Hwang, Agnes Gozdzik, Rosane Nisenbaum, Eric Latimer, Daniel Rabouin, Carol E Adair, Jimmy Bourque, Jo Connelly, and James Frankish, "Effect of Scattered-Site Housing Using Rent Supplements and Intensive Case Management on Housing Stability Among Homeless Adults with Mental Illness: A Randomized Trial," *JAMA,* Vol. 313, No. 9, 2015, pp. 905–915.

Stevens, Max, "Personal Communication by Max Stevens at the Evaluation Launch Meeting Held on 8/22/14 at Brilliant Corners," to Sarah Hunter, Los Angeles, Calif., 2014.

Thomas, M. Lori, Jeffery K. Shears, Melannie Clapsadl Pate, and Mary Ann Priester, *Moore Place Permanent Supportive Housing Evaluation Study: Year 1 Report*, Charlotte, N.C.: University of North Carolina at Charlotte, Department of Social Work, 2014.

Toros, Halil, Max Stevens, and Manuel Moreno, *Project 50: The Cost Effectiveness of the Permanent Supportive Housing Model in the Skid Row Section of Los Angeles County*, Los Angeles, Calif.: County of Los Angeles, Chief Executive Office–Service Integration Branch, 2012.

Tsai, Jack, Robert A. Rosenheck, Dennis P. Culhane, and Samantha Artiga, "Medicaid Expansion: Chronically Homeless Adults Will Need Targeted Enrollment and Access to a Broad Range of Services," *Health Affairs,* Vol. 32, No. 9, 2013, pp. 1552–1559.

Tsemberis, Sam, Leyla Gulcur, and Maria Nakae, "Housing First, Consumer Choice, and Harm Reduction for Homeless Individuals with a Dual Diagnosis," *American Journal of Public Health,* Vol. 94, No. 4, 2004, pp. 651–656.

U.S. Department of Housing and Urban Development, Office of the Assistant, Secretary for Community Planning and Development, "Homeless Emergency Assistance and Rapid Transition to Housing: Defining 'Homeless,'" *Federal Register,* Vol. 76, No. 233, 2011, pp. 75994–76019. As of August 5, 2016: https://www.hudexchange.info/resources/documents/HEARTH_HomelessDefinition_FinalRule.pdf

U.S. Department of Housing and Urban Development, Office of Community Planning and Development, *Part 1: Point-in-Time Estimates of Homelessness: The 2015 Annual Homeless Assessment Report (AHAR) to Congress*, Washington, D.C., 2015.

U.S. Department of Housing and Urban Development, Office of Policy Development and Research, "30% Low Income Limits," data set, 2016a. As of October 12, 2017: https://www.huduser.gov/portal/datasets/il/il16/IncomeLimits-30-FY16.pdf

U.S. Department of Housing and Urban Development, Office of Policy Development and Research, *Part 1: Point-in-Time Estimates of Homelessness*, Washington, D.C., 2016b.

U.S. Interagency Council on Homelessness, "Housing First," 2016. As of June 13, 2017: https://www.usich.gov/solutions/housing/housing-first

Ware, John E., *The SF-12v2™: How to Score Version 2 of the SF-12® Health Survey (with a Supplement Documenting Version 1)*, Lincoln, R.I.: Quality Metric, 2002.

Wright, Bill J., Keri B. Vartanian, Hsin-Fang Li, Natalie Royal, and Jennifer K. Matson, "Formerly Homeless People Had Lower Overall Health Care Expenditures After Moving into Supportive Housing," *Health Affairs,* Vol. 35, No. 1, 2016, pp. 20–27.

Wu, Fei, and Max Stevens, *The Services Homeless Single Adults Use and Their Associated Costs: An Examination of Utilization Patterns and Expenditures in Los Angeles County over One Fiscal Year*, Los Angeles, Calif.: County of Los Angeles, 2016.