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Health Care and Public Service Use and Costs Before and After Provision of Housing for Chronically Homeless Persons With Severe Alcohol Problems

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Context Chronically homeless individuals with severe alcohol problems often have multiple medical and psychiatric problems and use costly health and criminal justice services at high rates.

Objective To evaluate association of a "Housing First" intervention for chronically homeless individuals with severe alcohol problems with health care use and costs.

Design, Setting, and Participants Quasi-experimental design comparing 95 housed participants (with drinking permitted) with 39 wait-list control participants enrolled between November 2005 and March 2007 in Seattle, Washington.

Main Outcome Measures Use and cost of services (jail bookings, days incarcerated, shelter and sobering center use, hospital-based medical services, publicly funded alcohol and drug detoxification and treatment, emergency medical services, and Medicaid-funded services) for Housing First participants relative to wait-list controls.

Results Housing First participants had total costs of $8 175 922 in the year prior to the study, or median costs of $4066 per person per month (interquartile range [IQR], $2067-$8264). Median monthly costs decreased to $1492 (IQR, $337-$5709) and $958 (IQR, $98-$3200) after 6 and 12 months in housing, respectively. Poisson generalized estimating equation regressions using propensity score adjustments showed total cost rate reduction of 53% for housed participants relative to wait-list controls (rate ratio, 0.47; 95% confidence interval, 0.25-0.88) over the first 6 months. Total cost offsets for Housing First participants relative to controls averaged $2449 per person per month after accounting for housing program costs.

Conclusions In this population of chronically homeless individuals with high service use and costs, a Housing First program was associated with a relative decrease in costs after 6 months. These benefits increased to the extent that participants were retained in housing longer.

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Concerns about high public system costs incurred by chronically homeless individuals have inspired nationwide efforts to eliminate chronic homelessness.[1,2] Homeless people have high barriers to health care access generally but use acute care services at high rates.[3-5] Mortality rates among homeless adults are 3 or more times that of the general population.[6,7]

Chronically homeless people with severe alcohol problems, sometimes referred to as chronic public inebriates, are highly visible on the streets and are costly to the public through high use of publicly funded health and criminal justice systems resources.[8-12] Typical interventions such as shelters, abstinence-based housing, and treatment programs fail to reverse these patterns for this population.[10,13] Health conditions and mortality rates within this population are similar to those found in developing countries.[14,15] Average age at death is estimated to be 42 to 52 years, with 30% to 70% of deaths related to alcohol.[7,16,17]

The provision of housing reduces hospital visits, admissions, and duration of hospital stays among homeless individuals,[3,18,19] and overall public system spending is reduced by nearly as much as is spent on housing.[19] One type

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of supportive housing, called Housing First, removes the requirements for sobriety, treatment attendance, and other barriers to housing entrance.[20] Thus far, Housing First (HF) approaches have primarily targeted homeless people with serious mental illnesses and co-occurring substance use disorders.[20,21]

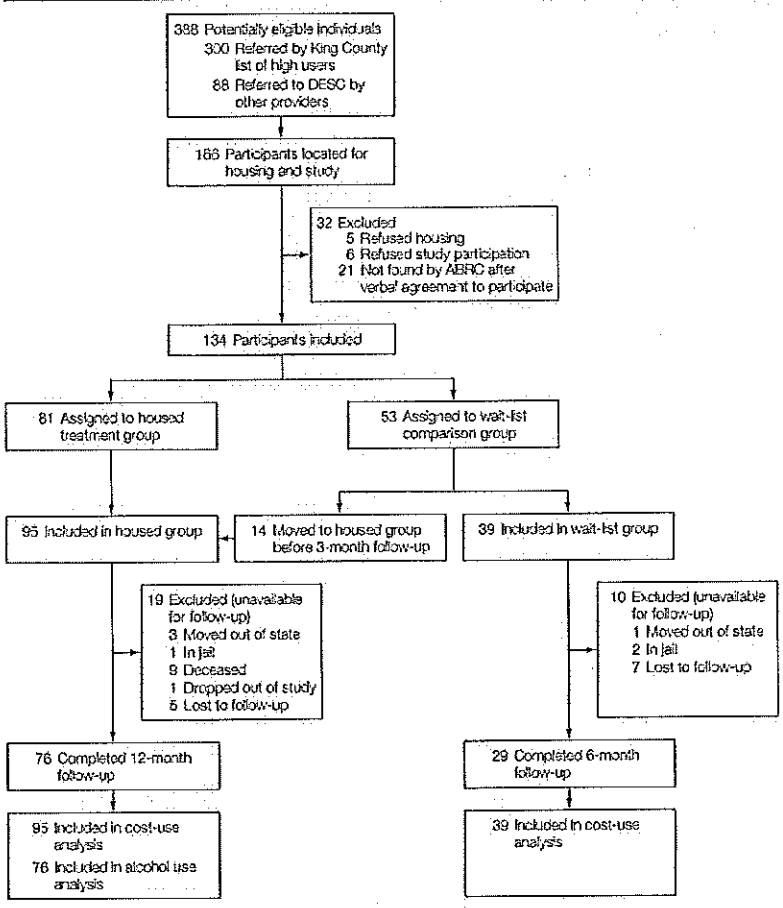
An HF program in Seattle—known as 1811 Eastlake—targets homeless adults with severe alcohol problems who use local crisis services at the highest levels. The project has been controversial because residents are allowed to drink in their rooms. The current study evaluated outcomes of the project on public use and costs for housed participants compared with wait-list controls and secondarily evaluated changes in reported alcohol use for housed participants and the effects of housing duration on service use.

METHODS

Participants and Recruitment Procedures

Participants were drawn from a rank-ordered list of chronically homeless individuals who incurred the highest total costs in 2004 for use of alcohol-related hospital emergency services, the sobering center, and King County jail. Community providers familiar with the population also recommended additional eligible individuals. Because it was considered unethical not to offer housing when available, random assignment to condition was not used. Rather, housing program staff offered housing to each person found from the list on a "first found, first assigned" basis. Once the housing was filled, additional participants were added to a wait-list. Verbal consent for research recruitment was gathered at initial contact, and written consent was obtained at the baseline interview. Eighty-one individuals were offered immediate housing and 14 individuals from the wait-list were housed prior to their 3-month assessment (mean, 44 days). These 95 participants were considered the treated group and compared with wait-list participants (n=39). Recruitment occurred between November 2005 and March 2007 (FIGURE 1). Because intervention participants were recruited first, data on wait-list controls were only available to 6 months whereas 12-month data were available for housed participants.

Figure 1. Participant Flow Diagram



Individuals were drawn from a list provided by secondary data sources and offered housing on a "first found, first assigned" basis. After 166 participants were located and enrolled in housing or placed on a wait-list, outreach employees discontinued searching for the remaining homeless individuals. DESC indicates Downtown Emergency Service Center; ABRC, Addictive Behaviors Research Center (University of Washington).

Procedure

Residents at 1811 Eastlake have no treatment requirements, but on-site case managers work to engage residents about substance use and life goals. Meals and on-site health care services are also offered. Per-person costs for the housing and services average $1120 per month.

Participants received $5 for attending the study introduction and $20 for each interview. Participants were interviewed at baseline and at 3, 6, 9, and 12 months after enrollment. Institutional review board approval was obtained from the University of Washington and King County Mental Health Chemical Abuse and Dependency Services Division (MHCADSD).

Use Measures

We collected administrative data from the MHCADSD, Washington Depart-

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ment of Social and Health Services, Harborview Medical Center (HMC), King County Correctional Facility, Public Health–Seattle & King County, and Downtown Emergency Service Center. With participants' written consent, specific itemized data were obtained, including days in jail and number of jail bookings; sobering center visits; HMC emergency department, inpatient, and outpatient contacts (date of service, length of stay for inpatient services, and billing amounts); emergency medical services (EMS) calls and transports; use of the Downtown Emergency Service Center shelter; and publicly funded medical detoxification and inpatient drug/alcohol treatment.

We also obtained claims submitted to Medicaid, which were examined for duplication with claims from other medical agencies. Only nonduplicated charges are reported. Medicaid and HMC data were actual billing amounts. Some services maintained data based on type and number of contacts or visits and not based on cost. In these cases, an estimate of the value of those services was provided by the reporting agencies (TABLE 1). The housing cost for individuals in the program was calculated by dividing the sum of all on-site operating (eg, maintenance, utilities, insurance, etc) and services costs by the capacity of the project (75 people housed at 1 time).

Self-report Measures

Self-reported demographic data included age, race/ethnicity, educational level, and marital status. Descriptive information included lifetime episodes of alcohol treatment from the Addiction Severity Index[22] as well as a detailed history of homelessness. A self-report medical health history form assessed chronic and acute illnesses. These data were used to describe the sample and assess comparability of housed with wait-list participants.

Alcohol use (lifetime use and frequency of drinking to intoxication) was assessed using items from the Current Substance Use Assessment of the Addiction Severity Index.[22] A modified version of the form 90-R (based on the Timeline Follow-back[23]) was used to calculate total number of standard drinks per day in the past 30 days.

Statistical Analysis

The present study is quasi-experimental[24] or observational[25] because it lacks random assignment, which can lead to imbalances between treatment groups. We used propensity scores to balance treatment groups on important covariates and strengthen causal inferences.

The primary outcomes are costs or contacts with public services per month, based on use indicators described here. A Poisson generalized estimating equation (GEE)[26] approach with a natural logarithm link function was the primary analytic method, and an offset term of the natural logarithm of months was included to control for varying exposure rates in some analyses. The GEE Poisson model provided a good fit to the marginal distribution of costs and thus was also used for cost data, rounded to the nearest dollar. The Poisson model can be shown to be a multiplicative model, so the exponentiated coefficients (ie, e^B) can be interpreted as relative rates (RRs) or percentage increases or decreases associated with the covariate. An RR of 1 would indicate no association; 95% confidence intervals (CIs) for RRs that include 1 indicate lack of statistical significance at $P<.05$.

There were no known missing data for use and costs. If a service was used, it was included in the archival data provided to researchers. All participants provided consent to access records throughout the study. Use of services outside the catchment area is unknown; however, there is no evidence that individuals in either condition ceased using all services during the follow-up period (which would suggest they had moved outside the catchment area).

In addition to descriptive analyses of use and cost data for HF and control participants, the primary analyses focused on HF vs control differences at 6 months. Secondary analyses focused on length of time in housing as a predictor of outcomes for all participants in 1811 Eastlake at some point in the study and changes in alcohol use for treated participants.

Table 1. Average Unit Costs for Services That Did Not Track Costs by Individual Use

Service	Cost, $	Per Unit
Sobering center	142.50	Day
Detoxification	148.59	Day
Jail	197.23	Booking
Jail	103.17	Day
EMS	714.00	Basic Life Support response
EMS	776.00	Advanced Life Support response
EMS	601.00	Transport to hospital
Shelter	23.71	Bed night

Abbreviation: EMS, emergency medical services.

For between-group analyses, we used propensity scores to balance treatment groups on important covariates.[25,27] Characteristics that are imbalanced across treatment conditions are often entered as covariates, and propensity scores provide a unified approach to treatment imbalance that is appropriate for observational data.[25] A logistic regression model was constructed with treatment condition as the outcome and prior 3 years of all outcomes as predictors, along with demographic variables, alcohol and drug use, and mental health problems. Predicted probabilities of being in the intervention group (propensity scores) were estimated for each individual, which provide a summary of the covariate imbalance across groups. The distributions of propensity scores across the 2 groups were notably different, with some regions of nonoverlap in the tails. We considered the issue of nonoverlap, regression to the mean, and participant death in sensitivity analyses for our primary analyses.

Death can strongly impact cost data in opposing directions, dependent on when the participant dies.[28] A participant who dies shortly after study entry may use few resources, whereas one who is sick for a longer period and then dies during the study may have very

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high cost data. The key issue is whether participant deaths bias observed results, particularly change over time for the treated group. Poisson GEE regressions were run using participant death as a covariate.

Power analyses showed that power of 0.80 could be achieved to detect a standardized mean difference of 0.30 with 60 housed participants and 40 wait-list control participants. Analyses were conducted using R version 2.7.0 (R Foundation for Statistical Computing, Vienna, Austria). All reported P values are 2-tailed; significance was set at $P<.05$.

RESULTS

Descriptive Statistics

TABLE 2 presents baseline sample demographics. Participants were predominantly male (94%) with a mean age of 48 years. The sample was ethnically diverse, with 39% identifying as white and 28% as American

Table 2. Baseline Descriptive Statistics for the Full Sample and by Treatment Group [a]

	Full Sample (n = 134)	Treatment Group (n = 95)	Control Group (n = 39)	P Value for Tests of Between-Group Differences[b]
Male, No. (%)	126 (94)	89 (94)	37 (95)	.79[c]
Age, mean (SD), y	48 (10)	48 (9)	48 (11)	.68[d]
Ethnicity, No. (%)				
White	52 (39)	38 (40)	14 (36)	.65[c]
American Indian/Alaska Native	38 (28)	26 (27)	12 (31)	
African American	13 (10)	7 (7)	6 (15)	
Hispanic or Latino American	8 (6)	7 (7)	1 (3)	
Native Hawaiian or other Pacific Islander	3 (2)	3 (3)	0	
Asian American	1 (1)	1 (1)	0	
More than 1 ethnic group	14 (10)	10 (11)	4 (10)	
Other	5 (4)	3 (3)	2 (5)	
Marital status, No. (%)				
Legally married or considered oneself married	5 (4)	3 (3)	2 (5)	.94[c]
Widowed	6 (5)	4 (4)	2 (5)	
Divorced or separated	55 (41)	39 (41)	16 (41)	
Never married	68 (51)	49 (52)	19 (49)	
Educational status, No. (%)				
Less than high school graduate or GED	44 (33)	35 (37)	9 (23)	.24[c]
Completed GED	15 (11)	9 (10)	6 (15)	
High school graduate	25 (19)	19 (20)	6 (15)	
Some vocational school	11 (8)	8 (8)	3 (8)	
Some college	31 (23)	17 (18)	14 (36)	
College graduate	6 (5)	5 (5)	1 (3)	
Some graduate school or advanced degree	2 (2)	2 (2)	0	
Serious medical problems in lifetime, No. (%)				
Hepatitis	54 (40)	38 (40)	16 (41)	.97[c]
Tuberculosis	24 (18)	19 (20)	5 (13)	.32[c]
Emphysema	10 (8)	8 (8)	2 (5)	.55[c]
Diabetes	10 (8)	7 (7)	3 (8)	.88[c]
Age first became homeless, mean (SD), y	31 (12)	30 (12)	32 (12)	.39[d]
Stable housing periods since first became homeless, mean (SD), No.	2 (3)	3 (.32)	2 (2)	.78[d]
Most common places to spend the night over past 3 y, No. (%)[e]				
On the street, under a bridge or freeway, in an abandoned car, or in a park	112 (84)	78 (82)	34 (87)	.55[c]
Sobering center	112 (84)	77 (81)	35 (90)	.26[c]
Hospital	100 (75)	72 (76)	28 (72)	.56[c]
Shelter	87 (65)	63 (66)	24 (62)	.55[c]
Motel or hotel	86 (64)	62 (65)	24 (62)	.15[c]
Times treated for alcohol abuse in lifetime, mean (SD), No.	16 (55)	17 (59)	14 (43)	.75[d]

Abbreviation: GED, general equivalency diploma.
[a] Percentages may not sum to 100 because of rounding.
[b] Differences by treatment group (treatment vs control) were examined. There were no significant differences between the 2 groups at baseline.
[c] χ^2 Test.
[d] t Test.
[e] All prior to living at 1811 Eastlake.

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Table 3. Medians and Interquartile Ranges for All Use Data on a per-Person per-Month Basis

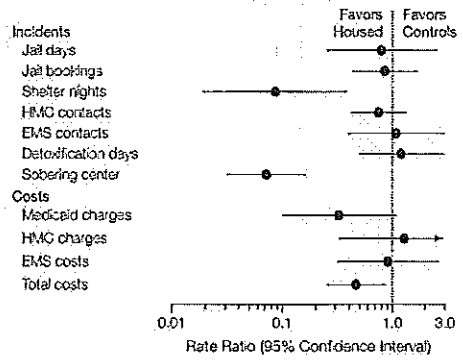
	Median (Interquartile Range)				
	1 Year Prior to Housing		6 Months After Intervention		12 Months After Intervention, Housed[a]
	Housed	Wait-List	Housed	Wait-List	
Contacts/incidents, No.					
Jail days	0.5 (0.2-2.5)	0.6 (0.3-2.3)	0.0 (0.0-1.8)	0.4 (0.0-1.5)	0.0 (0.0-0.3)
Jail bookings	0.2 (0.1-0.3)	0.2 (0.1-0.4)	0.0 (0.0-0.3)	0.2 (0.0-0.3)	0.0 (0.0-0.2)
Shelter nights	0.5 (0.1-3.5)	0.4 (0.1-1.2)	0.0 (0.0-0.0)	0.1 (0.0-0.4)	0.0 (0.0-0.0)
HMC[b]	0.9 (0.3-1.8)	0.7 (0.4-1.3)	0.7 (0.2-1.3)	0.3 (0.0-1.2)	0.3 (0.0-1.2)
EMS	0.4 (0.2-1.4)	0.4 (0.2-1.0)	0.5 (0.0-1.3)	0.3 (0.0-0.9)	0.2 (0.0-0.5)
Detoxification center[b]	0.0 (0.0-0.1)	0.1 (0.0-0.2)	0.0 (0.0-0.2)	0.0 (0.0-0.3)	0.0 (0.0-0.2)
Sobering center	6.1 (1.4-11.7)	4.0 (2.1-6.8)	0.0 (0.0-0.2)	2.1 (0.2-5.5)	0.0 (0.0-0.2)
Costs/charges, $					
Medicaid[b]	612 (31-4493)	345 (0-3173)	204 (0-2356)	107 (0-1965)	122 (0-1625)
HMC	139 (0-855)	743 (0-1616)	0 (0-271)	0 (0-921)	0 (0-117)
EMS	505 (167-1676)	553 (124-1253)	512 (0-1462)	438 (0-1116)	219 (0-460)
Total cost, $[b]	4066 (2067-8264)	3318 (1641-5029)	1492 (337-5709)	1932 (542-6217)	958 (98-3200)

Abbreviations: EMS, emergency medical services; HMC, Harborview Medical Center.
[a]Because intervention participants were recruited first, data for wait-list controls were only available to 6 months.
[b]Significantly different at baseline for the 2 groups.

Indian/Alaska Native. As noted in Table 2, participants reported high rates of acute and chronic medical illness, a mean of 16 alcohol treatment episodes, and minimal periods of stable housing during nearly 2 decades of homelessness.

TABLE 3 contains medians and interquartile ranges for all primary outcomes, in units per month, for the year prior to intervention, up to 6 months after intervention, and 7 to 12 months after intervention. In the year prior to the study, housed participants accrued a median $4066 per month per individual of use costs. Thus, in the year prior to intervention, $8 175 922 in costs were accrued by the 95 individuals who received housing. Individual median costs per month drop notably after 6 months ($1492) and again at 12 months ($958), and total costs for the housed group for the year after enrollment in housing were $4 094 291. Wait-list control participants accrued median costs of $3318 per month per individual in the year prior to the study, dropping to $1932 at 6 months. A similar pattern held up across most outcomes, with the exception of EMS services, which showed a slight increase at 6 months for HF participants before dropping at 12 months.

Figure 2. Rate Ratios and 95% Confidence Intervals for Treatment Differences at 6 Months



Treatment differences were based on Poisson generalized estimating equation regression including propensity score adjustments. HMC indicates Harborview Medical Center; EMS, emergency medical services.

Comparison of HF and Control Participants at 6 Months

Poisson GEE regressions with propensity score adjustments were used for all outcomes, comparing treated vs control participants at 6 months. There were no significant differences between HF and control participants prior to the intervention, controlling for propensity scores. FIGURE 2 presents rate ratios with 95% CIs for the time × treatment interaction, which is a direct test of treatment differences at 6 months. There is a significant difference between HF and control groups in total costs, with HF participants accruing approximately 53% less costs compared with controls over the first 6 months of the study (RR, 0.47; 95% CI, 0.25-0.88).

Cost offsets were calculated using a difference-in-differences approach. Mean per-month total costs were estimated for 1 year prior to intervention and for 6 months of intervention, for housed and control groups separately. Housed participants had $3569 less cost per month during the housed period relative to control participants. Housing costs were $1120 per person per month, yielding a total mean cost off-

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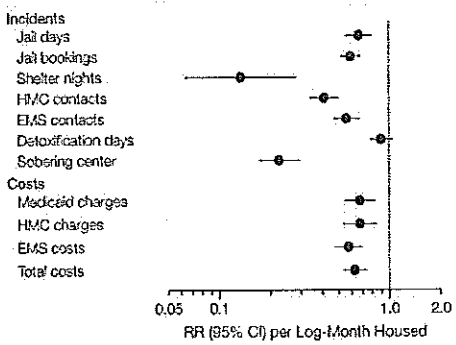
set of $2449 per person per month for HF participants.

Participants were chosen because they had extreme health care use and costs, and thus one concern is regression to the mean (ie, extreme scores will tend to be less extreme in the future). We examined sensitivity of the 6-month treatment differences for the subset of our housed and control samples with overlapping propensity scores (thus, they were highly similar on background characteristics and costs). Results were identical to those reported, providing evidence that observed treatment differences were not purely artifacts of regression to the mean.

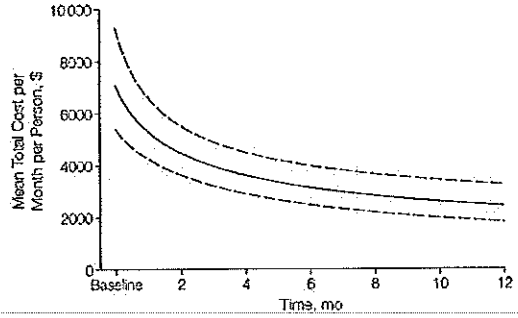
A second concern was that 9 participants died, and all were in the housed condition. Of 388 high-use potential participants originally proposed as eligible for this study, 37 are known to have died prior to or during the study period; thus, the mortality rate in the HF sample was consistent with the broader study population. Five HF residents died from previously diagnosed chronic illness, including liver cancer (1), cardiovascular disease (3), and unspecified natural causes (1). One of these deaths may have been contributed to by cocaine overdose. Two died from blunt-force head trauma (likely due to falling), both outside the house (1 after the resident had left the housing program). One remaining participant died from a suspected heroin overdose. In analyses using participant death as a covariate, those who died during the study had nonsignificantly higher costs prior to housing (RR, 1.66; 95% CI, 0.90-2.97); however, there was no evidence of differential change across time. Further, analyses removing those who died led to identical conclusions as those reported.

Figure 3. Use Reduction With Longer Time in Housing



Based on Poisson generalized estimating equation regression. Time in house was transformed using the natural logarithm to yield a linear relationship with costs. Thus, rate ratios are based on log-month time. HMC indicates Harborview Medical Center; EMS, emergency medical services; RR, rate ratio; CI, confidence interval.

Figure 4. Predicted Mean Total Cost per Participant During Time in Housing



One hundred eleven participants were housed at some point during the study (95 initially assigned to housing and 16 initially assigned to wait-list group). Median time in housing was 17.2 months (interquartile range, 6.4-26.7 months). Solid line indicates predicted mean decrease in total cost per person based on Poisson generalized estimating equation regression. Dashed lines indicate 95% confidence intervals.

Effect of Length of Time in House

Poisson GEE regressions assessed the association between length of time in the house and costs/use for all participants who were housed at some point, regardless of treatment condition (ie, wait-list control participants were housed as spots became available, and 16 of the 39 wait-list participants moved in after the 6-month follow-up and provided data for the present analyses). Two sources of data were used: per-month use for 1 year prior to house entry and total use for the period of time that the participant was in the house. Time was modeled using a natural logarithm transformation. All outcomes except days in the detoxification center showed a significant negative association with the logarithm of time, indicating that use dropped as participants were housed longer. FIGURE 3 shows rate ratios with 95% CIs for reduction in use and costs over time, and FIGURE 4 shows the predicted regression line of drop in total costs. (Note that the baseline costs in Figure 4 appear higher than those reported in Table 3 because Table 3 reported a median whereas the predicted regression line is based on a mean.)

Alcohol Use

Average number of daily drinks was assessed for change from the year prior to intervention to 6, 9, and 12 months in housing. Because a small number of participants reported drinking impossible amounts of alcohol (eg, 100 or more standard drinks per day), data that were more than 70 were reduced and set to 70.[39] Median number of drinks

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dropped steadily, from 15.7 per day prior to housing to 14.0, 12.5, and 10.6 per day at 6, 9, and 12 months in housing, respectively. Poisson GEE with a linear time covariate showed a similar trend to the medians, with an approximate 2% decrease per month in daily drinking while participants were housed (RR, 0.98; 95% CI, 0.96-0.99). Participants also showed a decreasing trend across time in housing for self-reported number of days drinking to intoxication from the Addiction Severity Index, with medians of 28, 15, 20, and 10 days (out of 30 days) at baseline and 6, 9, and 12 months, respectively. Due to severe bimodality in the distribution, a rank-based nonparametric test was used to assess change across time. Kendall coefficient of concordance revealed a significant decrease in days intoxicated (χ^2_3=14.6, P = .003).

COMMENT

The project demonstrated significant cost savings and reductions in alcohol use for housed individuals over the course of the first year. Cost offsets for HF participants at 6 months, in comparison with wait-list controls and accounting for the cost of housing, averaged $2449 per person per month. At 12 months, the 95 housed individuals had reduced their total costs by more than $4.0 million compared with the year prior to enrollment, or $42 964 per person per year, as compared with a cost of $13 440 per person per year to administer the housing program. Finally, length of time in housing was significantly related to reductions in use and cost of services, with those housed for the longest period of time experiencing the greatest reductions.

The study also demonstrated that individuals in the housed group experienced reductions in their alcohol use and likelihood of drinking to intoxication over time. The HF intervention was associated with substantial declines in drinking despite no requirement to abstain from or reduce drinking to remain housed.

As with other studies of supportive housing for mentally ill homeless people, this study showed decreases in the use of expensive crisis-oriented systems like hospitals and jails.[5,19] Additionally, this study showed substantial improvement in overall expenditures for participants even when factoring in the costs of the housing and services provided, in contrast with other cost-offset studies.[19,30] This intervention sought out the individuals with the most severe problems who had consumed the most services prior to housing enrollment, offering more opportunity for cost offsets to be realized.

The current study focused on a primarily alcohol-dependent population brought into a housing environment. Although one prior study demonstrated success in use reductions by enrolling a similar population in treatment in lieu of incarceration, overall acceptance of the treatment intervention was only 58%[31] compared with 95% acceptance of the housing in our study. Another study found that 91% of chronically homeless people with severe alcohol problems identified a need for housing assistance, but only 64% identified a need for alcohol treatment.[32] Moreover, permanent supportive housing programs without treatment requirements have been shown to be preferred among homeless mentally ill people while demonstrating similar retention rates compared with more structured, treatment-based programs.[30,33] Thus, HF is more acceptable to the target population than treatment while resulting in similar benefits.

The effect of housing on alcohol use has also been seen in other HF approaches. Such programs have shown stability or improvement in alcohol use among individuals with primary mental illness.[20,34] Concerns have been raised about the effect of low-demand housing on alcohol and drug treatment acceptance or adherence. A recent study found cocaine-dependent homeless people in treatment were more likely to abstain from drug use when in abstinence-based housing than in other housing.[35,36] Importantly, however, the study also demonstrated that being in any housing resulted in more abstinence than remaining homeless did.[35,36] Thus, the current study is consistent with prior research demonstrating benefits of stable housing on alcohol use despite the fact that participants were neither expected to abstain from alcohol nor required to access treatment as a condition of housing.

The current study has several limitations. Participants were not randomly assigned to condition, and there were differences between groups in costs of services used prior to enrollment. While the propensity score approach statistically controlled for these differences, and sensitivity analyses using only those with similar background characteristics and use at baseline found equivalent results, the potential impact of these differences on the pattern of outcomes cannot be completely dismissed. The current sample was also drawn from a population with extremely high use of publicly funded services, and it is likely that cost offsets would be attenuated in a less-severe sample. Future research using larger and more representative samples and stronger comparative research designs is warranted to address these issues.

Further, the current study relied on archival data from official databases for evaluating use and costs of services. Although this is a strength, limitations to archival databases can include incorrect or inaccurate entries, failure to appropriately match participants between study and archival databases due to spelling or other errors, and delay in entry of records into archival databases. Extensive review of archival records was undertaken to ensure accurate matching of participants. Further, there is no reason to believe these errors would be more apparent at one assessment point than another or between housed and wait-list groups.

An additional limitation is the inclusion of only 1 hospital in the records search. Harborview Medical Center is the most commonly used area hospital for this population, but it is likely that other hospital-based care was provided and may not be reflected in the

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Medicaid data. Because the HF project maintains a close relationship with Harborview, use of outside medical services likely declines more for HF residents than for wait-list controls. Further, HF residents are assisted in obtaining Medicaid, so Medicaid records may also capture more of their true costs. As a result, the current cost comparison between these groups probably represents a conservative estimate of the true advantages of HF.

Although our study population's burden on many public systems was reduced substantially, not all of this translated directly to reduced overall public expenditures. Outside of billed HMC and Medicaid medical services, costs were calculated primarily from average unit costs at the reporting agencies. Using jail as an example, total public costs would not decrease noticeably unless enough incarcerations were avoided to justify decreasing numbers of jail personnel, etc. In the current study, 59.0% of mean per-person per-month cost reductions in the HF group were attributable to billed medical services, and this represented 76.6% of the mean cost offsets for HF participants compared with the wait-list control group at 6 months. In addition to real dollar savings, reduced use of other services by the study population has implications for improved service delivery; greater access to care for other individuals; and increased ability of police, judicial, and jail personnel to focus on issues of higher priority to public safety.

Despite limitations, the current study adds to the body of literature in support of HF. Reductions in health care and criminal justice system use and costs and alcohol consumption support expansion and replication of this low-threshold approach. Repeated unsuccessful participation in traditional programs such as abstinence-based or mandated treatment, and high rejection rates of these programs by chronically homeless individuals with alcohol problems, suggests that less conventional approaches such as HF are also needed.

The large reduction in emergency health care expenses by HF participants has implications for health care systems, particularly health service payers and providers of high levels of uncompensated care. These groups might want to partner with supportive housing providers to care for the highest alcohol-related users of hospital services to reduce expenses.

Additional implications are for the creation of more specific alcohol interventions for this population when they become housed. Residents of HF are offered support and counseling about substance use but have no expectation of treatment engagement or abstinence. The setting is therefore appropriate for future harm reduction interventions for those who want to address their alcohol-related problems. Approaches could include adaptation of skills-building curricula aimed at other heavy-drinking populations[37] or implementation of a managed alcohol administration program such as those programs already showing initial promise for this population in shelter settings.[11,38]

CONCLUSIONS

These findings support the basic premise of Housing First: providing housing to individuals who remain actively addicted to alcohol, without conditions such as abstinence or treatment attendance, can reduce the public burden associated with overuse of crisis services and reduce alcohol consumption. Findings suggest that permanent, rather than temporary, housing may be necessary to fully realize these cost savings, because benefits continued to accrue the longer these individuals were housed. Findings support strategies to retain these individuals in housing, including offering on-site medical and mental health services, supportive case managers, and minimal rules and regulations pertaining to their housing. In sum, HF is associated with improvements in the life circumstances and drinking behaviors of this chronically homeless population while reducing their use of expensive health and criminal justice services.

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Study concept and design: Larimer, Malone, Garner, Burlingham, Lonczak, Ginzler, Clifasefi, Hobson, Marlatt.
Acquisition of data: Larimer, Garner, Burlingham, Lonczak, Tanzer, Ginzler, Clifasefi.
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Drafting of the manuscript: Larimer, Malone, Garner, Atkins, Burlingham, Lonczak, Tanzer, Ginzler, Clifasefi, Hobson, Marlatt.
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DENVER HOUSING FIRST COLLABORATIVE

COST BENEFIT ANALYSIS AND PROGRAM OUTCOMES REPORT

By: **Jennifer Perlman, PsyD, and**
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Colorado Coalition for the Homeless

December 11, 2006

DENVER HOUSING FIRST COLLABORATIVE

COST BENEFIT ANALYSIS AND PROGRAM OUTCOMES REPORT

December 11, 2006

EXECUTIVE SUMMARY

The **Colorado Coalition for the Homeless** created the Denver Housing First Collaborative (DHFC) in 2003 with funding provided by a collaboration of federal agencies. The DHFC involved CCH as the lead agency, **Denver Department of Human Services** (DDHS), **Denver Health** (DHHA), **Arapahoe House**, the Mental Health Center of Denver (MHCD) and the Denver VA Medical Center.

The DHFC is designed to provide comprehensive housing and supportive services to chronically homeless individuals with disabilities. Initial federal funding created the capacity to house and serve 100 chronically homeless individuals. The program uses a housing first strategy combined with assertive community treatment (ACT) services, providing integrated health, mental health, substance treatment and support services.

The housing first approach has been incorporated as a priority strategy into **Denver's Road Home** – Denver's Ten Year Plan to End Homelessness. Denver's Road Home has provided funding to create a second housing first team at CCH – the 16th Street Housing First Program – to serve an additional 50 chronically homeless individuals.

The goals of the DHFC are to increase the residential stability and overall health status of chronically homeless individuals while reducing the utilization and costs of emergency services being provided to chronically homeless persons with taxpayer funds.

The Cost Benefit Analysis focused on examining the actual health and emergency service records of a sample of participants of the DHFC for the 24 month period prior to entering the program and the 24 month period after entering the program. Participants provided releases of information for their medical, psychiatric, legal and substance treatment records and associated costs for the four year period. Cost data from the clinical records were analyzed to determine the emergency room, inpatient medical or psychiatric, outpatient medical, Detox services, incarceration, and shelter costs and utilization.

The findings document an overall reduction in emergency services costs for the sample group. The total emergency related costs for the sample group declined by 72.95 percent, or nearly $600,000 in the 24 months of participation in the DHFC program compared with the 24 months prior to entry in the program. The total emergency cost savings averaged $31,545 per participant.

Utilization of emergency room care, inpatient medical and psychiatric care, detox services, incarceration, and emergency shelter were significantly reduced by participation in the program. Only outpatient health costs increased, as participants were directed to more appropriate and cost effective services by the program.

Emergency room visits and costs were reduced by an average of 34.3 percent. Inpatient visits were reduced by 40 percent, while inpatient nights were reduced by 80 percent. Overall inpatient costs were reduced by 66 percent.

Detox visits were dramatically reduced by 82 percent, with a average cost savings of $8,732 per person, or 84 percent.

Incarceration days and costs were reduced by 76 percent, and emergency shelter costs were reduced by an average of $13,600 per person.

If the average cost savings of $31,545 per persons are projected for the 150 chronically homeless individuals currently participating in CCH's two housing first programs, the total savings would amount to $4.7 million. If these average costs savings are projected each of the 513 chronically homeless persons estimated in Denver who are eligible for the DHFC program, the savings would amount to $16.1 million.

When the investment costs of providing comprehensive supportive housing and services through the Housing First Program are factored in, there is a net cost savings of $4,745 per person. Thus, the total net cost savings for the current in the Denver housing first programs are projected to be $711,734. The projected net cost savings for all 513 chronically homeless persons, if provided access housing first programs, would be $2,424,131.

In addition to saving taxpayers money, the local and national evaluations of the DHFC program document overall improvement in the health status and residential stability of program participants. For these persons, who averaged nearly 8 years of homelessness each prior to entering the program, 77 percent of those entering the program continue to be housed in the program. More than 80 percent have maintained their housing for 6 months.

Fifty percent of participants have documented improvements in their health status, 43% have improved mental health status, 15% have decreased their substance use, and 64% have improved their overall quality of life.

In addition, the majority of participants have been assisted to obtain the public benefits for which they are eligible, or to obtain employment. The average monthly income of participants increased from $185 at entry to $431.

After two years of operation, Denver Housing First Collaborative approach offers tremendous promise of improving the health status of chronically homeless individuals while reducing taxpayer funded emergency costs of emergency room care, hospitalizations, incarceration and detox.

Furthermore, the overall quality of life for the community can be significantly improved as the negative impacts of individuals living and sleeping on the streets are reduced.

DENVER HOUSING FIRST COLLABORATIVE

COST BENEFIT ANALYSIS AND PROGRAM OUTCOMES REPORT

December 11, 2006

I. BACKGROUND:

The Denver Housing First Collaborative (DHFC) is a collaboration between the **Colorado Coalition for the Homeless** (CCH), **Denver Department of Human Services** (DDHS), **Denver Health** (DHHA), **Arapahoe House**, the **Mental Health Center of Denver** (MHCD) and the **Denver VA Medical Center**. Together the collaborative combines a Housing First approach with an Assertive Community Treatment (ACT) team of multi-disciplinary and multi-agency providers to assist chronically homeless individuals with disabilities to obtain permanent housing, support services and eligible benefits to help them gain the stability needed to end their homelessness.

The DHFC was one of eleven programs funded nationally in 2003 through the Ending Chronic Homeless Initiative program, a collaborative grant from the Health Resource Service Administration (HRSA), Housing and Urban Development (HUD), the Substance Abuse Mental Health Service Administration (SAMSHA) and the Department of Veterans Affairs (VA). The goal of the national initiative was to provide permanent housing and supportive services to persons experiencing chronic homelessness in order to transition them out of homelessness and connect them with mainstream services.

The Collaborative was initially funded for three years to provide integrated housing and services for 100 chronically homeless individuals. In 2005, the City and County of Denver, through **Denver's Road Home**, funded an second housing first ACT team to provide housing and treatment services to an additional 50 chronically homeless individuals.

II. PROGRAM ELEMENTS:

The **Housing First approach** is designed to respond to the most acute need of chronically homeless individuals with disabilities – **housing** – and through the provision of housing, to respond to the other services the participant may need to maintain that housing and to improve their level of health and functioning. For those participants for whom treatment is not a present priority, the Housing First approach allows them to access needed housing immediately. Likewise, for those who have had negative experiences with the treatment system, the provision of housing helps to build trust, lessen the negative impact of homelessness on the underlying disabilities, and ultimately lead to more positive treatment outcomes. For those persons who are ready to access treatment as part of a permanent housing strategy, the project assists them to obtain the treatment they need, holding their housing for them during this process. For those who choose to engage in residential treatment prior to obtaining permanent housing, we ensure that a housing unit is available to them at the end of treatment.

Housing is provided through a combination of project based and tenant based rental assistance. Approximately 35% of the participants are housed in a supportive housing development, such as

the Renaissance at Civic Center Apartments. The remaining participants live in scattered site apartments owned by private landlords. Tenants pay 30% of their income for rent, and the program pays the balance directly to the landlord.

The **Assertive Community Treatment** (ACT) model uses an intensive case management team that has the capacity to provide integrated support services including: health care, mental health care, substance treatment, psychiatric evaluation, medication management, benefits acquisition and supported employment and education opportunities. A major component of the ACT team is to deliver services to the consumer in the community as opposed to requiring them to come into an office. Serving people within their own environment helps to decrease fear and improve the therapeutic alliance which results in increased acceptance of treatment. Therapy is also provided in a non-traditional manner.

III. DHFC PARTICIPANT STATUS:

The DHF program began accepting referrals in January, 2004. By the end of 2004, there had been 739 referrals. Of these 171 reported having both a substance use and mental health disability. 160 reported a substance use, mental health and physical disability. 102 reported only a substance use disability and 47 reported only a mental health disability. Another 58 reported only a physical disability. The vast majority of individuals indicated at least two and often three disabling conditions.

The DHFC prioritized those individuals who had multiple disabilities and those for whom other programs or services were not effective. Program participants enrolled in the program had an average of 8 years of homelessness each prior to entering the program.

Over the first two years, the program enrolled 137 participants, and provided housing to 133 participants. Thirty persons have been discharged from the program for a variety of reasons. There are currently 107 active participants. 100 of these participants are currently housed. There are an additional 50 enrolled and housed in the 16th Street Housing First Program.

IV. COSTS BENEFITS METHODOLOGY

All Denver Housing First Collaborative participants who had been enrolled in the program for twenty-four or more months were eligible for inclusion in the cost study. A total of 36 people met the criteria at the time the cost study was conducted. Nineteen (19) people initially signed informed consents to participate in the study and completed the necessary releases of information for dissemination to area medical, psychiatric and substance treatment facilities. This report is based on this sample of 19.

The project utilized two methods of data collection. First participants were asked to have their medical, psychiatric, legal and substance treatment records and associated costs released for a four year period (the two years pre-enrollment in the DHFC program and the first two years following program enrollment). The second data collection method involved an interview with each participant, asking them to recall their service use over the same four year period. In addition participants were asked to answer several open ended questions about their thoughts and feelings regarding the DHFC and its impact on their lives.

During the months of October and November 2006 releases of information were sent out to local hospitals, treatment facilities and all local jails and state prisons requesting records and associated costs for the 19 participants. Within three weeks all records were received and data was entered into a spreadsheet. The spreadsheet was divided into two time frames, the two years prior to entering the DHFC and the first two years following enrollment in the program. Cost data from the clinical records were entered into the database, yielding costs associated with the seven service types under investigation. The services being observed included the following: Emergency room, inpatient medical or psychiatric, outpatient medical, Detox services, incarceration, and shelter utilization.

Once all the data was analyzed an average cost per person over the two distinct two year periods for each of the identified services was calculated. The product yielded pre-entry treatment utilization and cost figures, as well as post-entry treatment utilization and cost. Total costs and change-in-costs were calculated for the 19 participants for both pre-entry and post-entry periods.

V. COSTS BENEFITS RESULTS

A. Health Related Costs:

The sample cohort utilized **emergency room services** a total of 67 times in the period prior to entry in the DHFC program. This same cohort utilized emergency room services 44 times in the period after entry in the program. Thus, emergency room visits declined by 34.3% after entry in the DHFC program. The associated costs of emergency room care for this group declined from $99,860 to $65,579, a reduction of $34,280 or 34%.

The sample cohort utilized **outpatient medical services** a total of 91 times in the period prior to entry in the DHFC program. They utilized outpatient medical services 92 times in the period after entry in the program. Outpatient visits increased slightly by 1.1% after entry in the DHFC program. The associated costs of outpatient medical services for this group increased from $33,199 to $50,184, an increase of $16,984 or 51%. This increase was expected as DHFC clients were directed to more appropriate outpatient care rather than more expensive emergency room care.

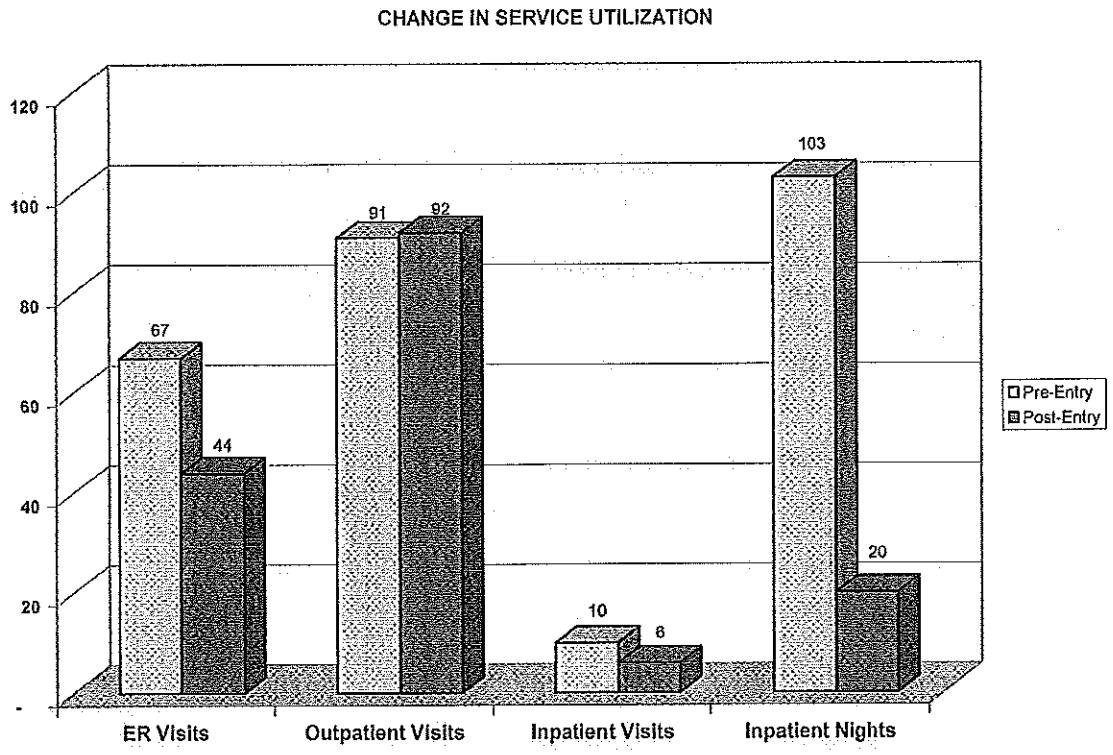
The sample cohort accounted for 10 **inpatient hospital visits** for a total of 103 **inpatient nights** in the period prior to entry in the DHFC program. They had 6 inpatient hospital visits for a total of 30 inpatient nights in the period after entry in the program. Thus, inpatient visits were reduced by 40% and inpatient nights were reduced by 80.6% after entry in the program. The associated costs of inpatient hospital care for this group decreased from $197,173 to $67,118, a decrease of $130,055 or 66.0%.

Overall, the total health related costs for this group decreased from $330,231 to $182,881, a decrease of $147,350 or 44.6%. The average total health related costs decreased from $17,381 to $8,625 , a decrease of $7,755 per person or 44.6%.

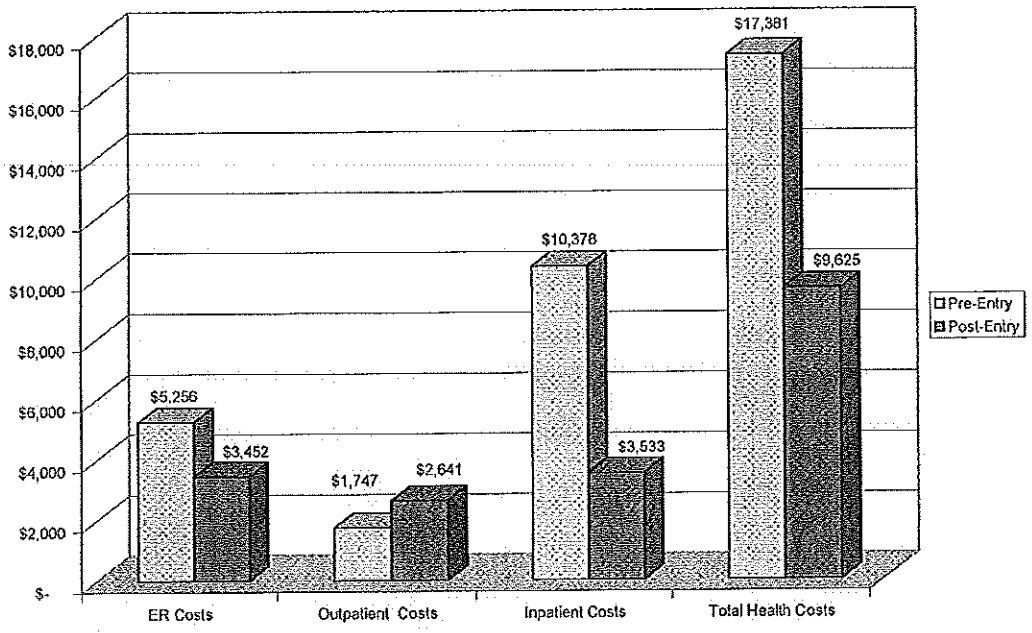
The following charts show the changes in average health service utilization and costs for program participants.

CHANGE IN HEALTH CARE UTILIZATION AND COSTS

N= 19	Total Pre-Entry	Average Pre-Entry	Total Post-Entry	Average Post-Entry	Total Change	Average Change	% Change
ER Visits	67	3.53	44	2.32	- 23	- 1.21	- 34.3 %
ER Costs	$ 99,860	$ 5,256	$ 65,579	$ 3,452	- $34,280	- $1,804	- 34.3 %
Outpatient Visits	91.00	4.79	92.00	4.84	1.00	0.05	1.1 %
Outpatient Costs	$ 33,199	$ 1,747	$ 50,184	$ 2,641	$16,984	$ 894	51.2 %
Inpatient Visits	10.00	0.53	6.00	0.32	- 4.00	- 0.21	- 40.0 %
Inpatient Nights	103.00	5.42	20.00	1.05	- 83.00	- 4.37	- 80.6 %
Inpatient Costs	$ 197,173	$ 10,378	$ 67,118	$ 3,533	-$130,055	-$6,845	- 66.0 %
Total Health Costs	$ 330,231	$ 17,381	$ 182,881	$ 9,625	-$147,351	-$7,755	- 44.6%



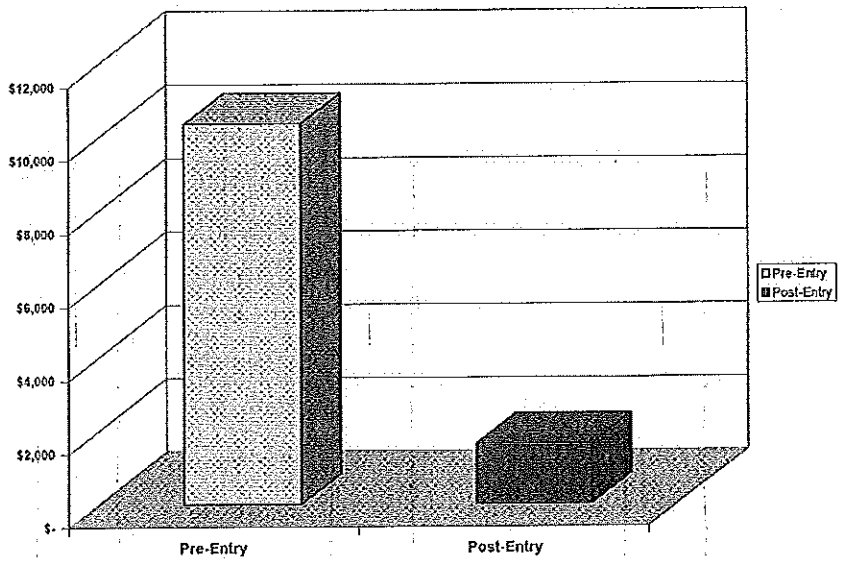
CHANGE IN AVERAGE HEALTH COSTS

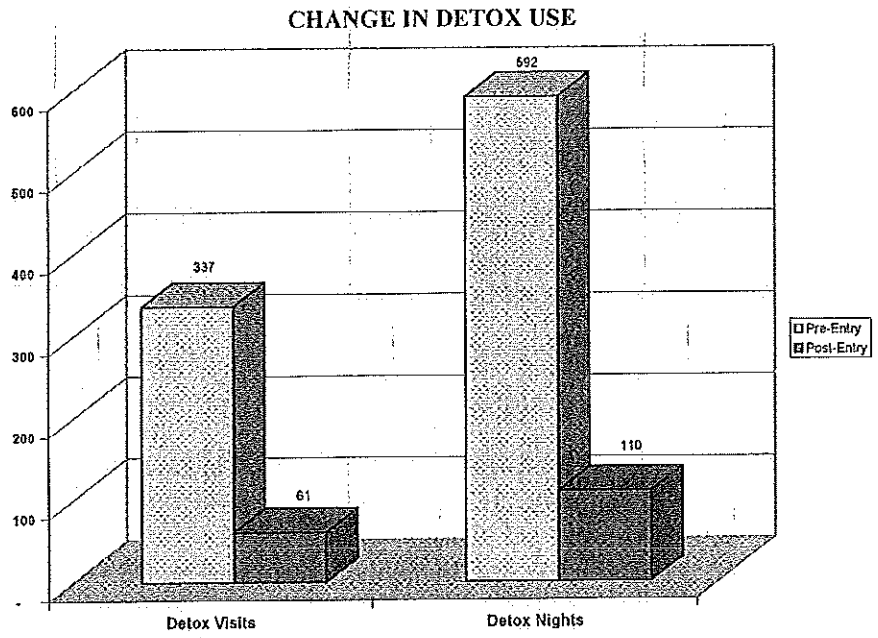


B. Detox Costs:

The sample cohort utilized **detoxification services** a total of 337 times in the period prior to entry in the DHFC program. This accounted for 592 **detox nights**. This same cohort had 61 detox visits for a total of 110 detox nights in the period after entry in the program. Thus, detox visits declined by 81.9% and detox nights declined by 81.4% after entry in the DHFC program. The associated costs of detox services for this group declined from $197,086 to $31,579, a reduction of $165,915 or 84.2%. The average per person detox costs savings was $$8,732.

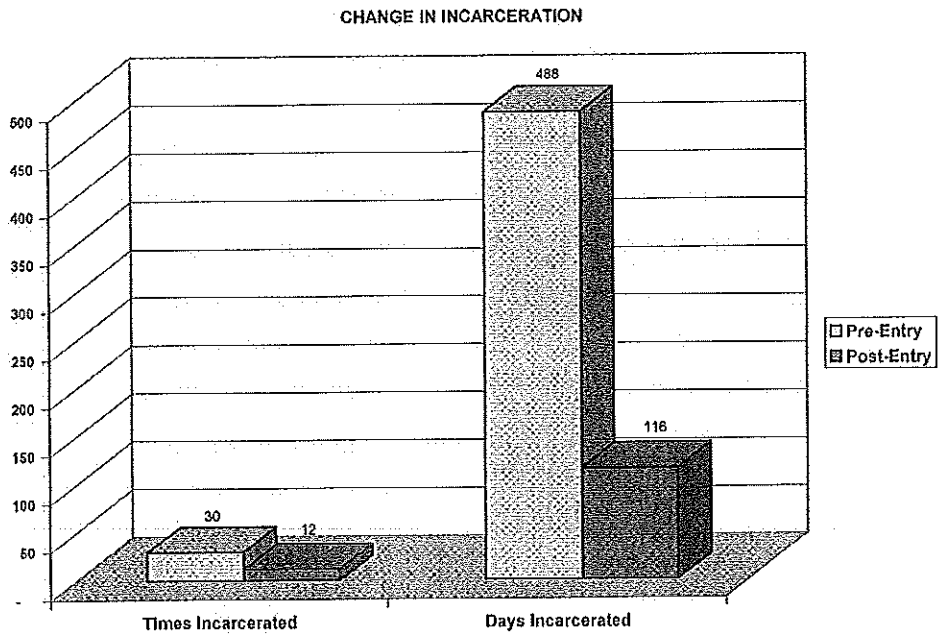
CHANGE IN AVERAGE DETOX COSTS

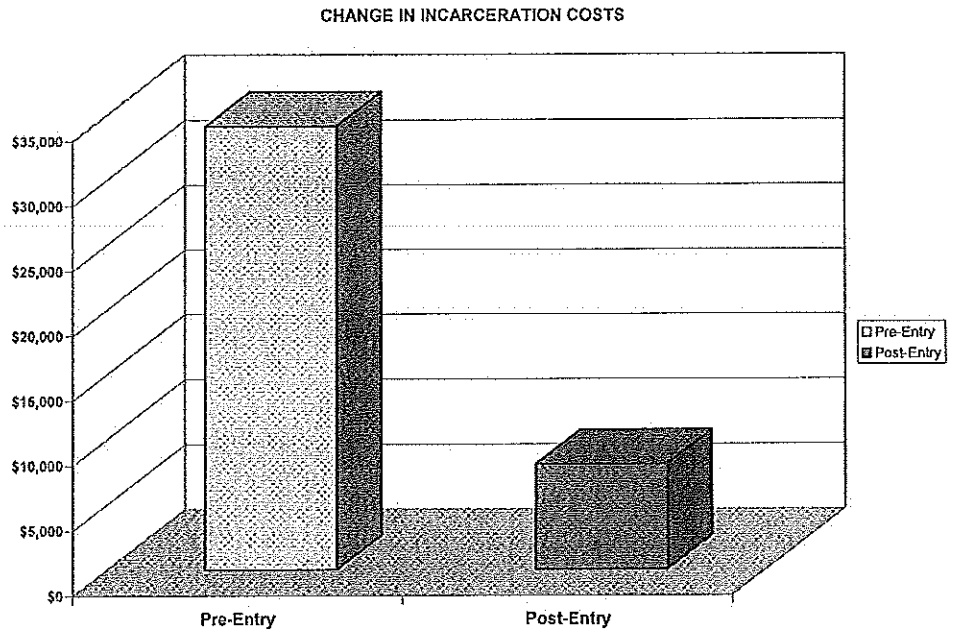




C. Incarceration Costs:

The sample cohort was **incarcerated** at county jails a total of 30 times in the period prior to entry in the DHFC program. This accounted for 488 **nights of incarceration.** This same cohort had 12 jail visits for a total of 116 jail nights in the period after entry in the program, a reduction of 60% of jail visits and a reduction of 76.2% of jail nights. The associated costs of incarceration for this group declined from $34,160 to $8,120, a reduction of $26,040 or 76%.





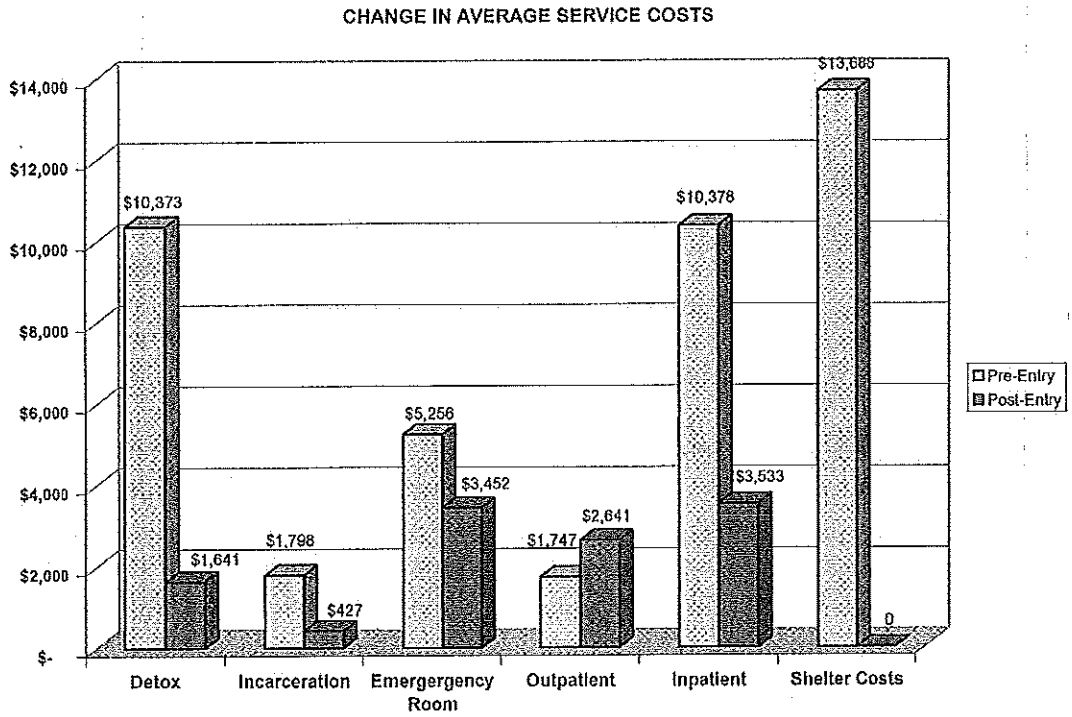
CHANGES IN INCARCERATION							
N= 19	Total Pre-Entry	Average Pre-Entry	Total Post-Entry	Average Post-Entry	Total Change	Average Change	% Change
# of Incarcerations	30	2	12	1	- 18	- 1	- 60.00 %
Days Incarcerated	488	26	116	6	- 372	- 20	- 76.23 %
Incarceration Costs	$ 34,160	$ 1,798	$ 8,120	$ 427	- $26,040	- $ 1,371	- 76.23 %

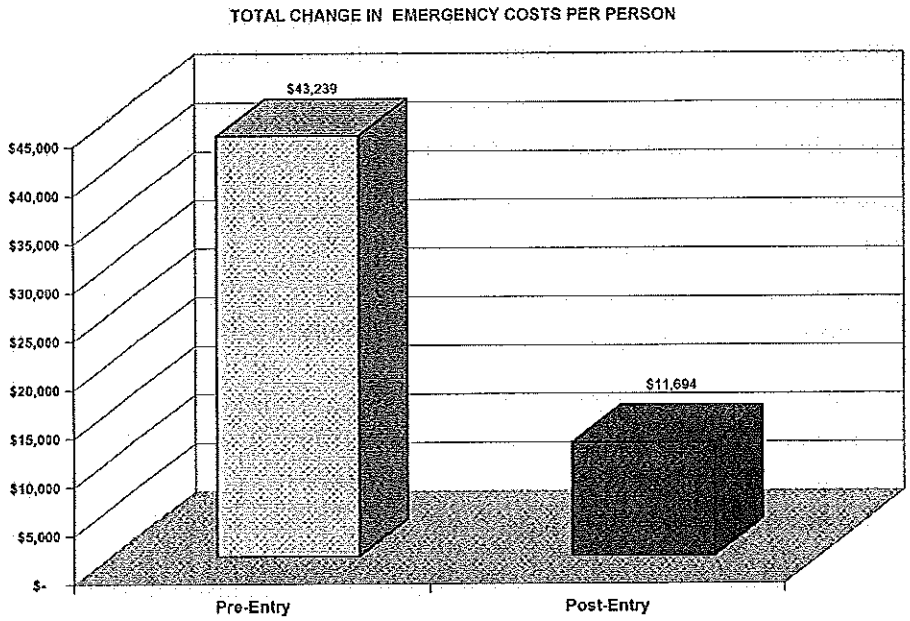
D. Emergency Shelter Costs:

All participants in the sample cohort utilized emergency shelter services in the period prior to entering the DHFC program. According to the surveys, we estimate the participants used emergency shelter services and average of 274 nights per year prior to entering the program. The average emergency shelter costs in Denver are $25 per night. Thus, the associated costs of emergency shelter utilization for this group were $13,688 for the period prior to entering the DHFC program. The costs of emergency shelter were reduced to $0 for the period after entering the program.

E. Total Costs Savings

The total emergency related costs for the sample cohort for the 24 months prior to entry in the DHFC program was $821,539. The total emergency related costs for this group after entering the program was $222,186, a reduction of $599,356 or 72.95%. The total costs savings amounts to an average of $31,545 per participant.





There are a total of 100 participants in the Denver Housing First Collaborative. In addition, there are 50 participants in the 16th Street Housing First Program. If the average costs savings of $31,545 are applied to each of the 150 participants in Denver housing first programs, the associated costs savings over the two year period would amount to $4,731,734 for these participants.

There are an estimated 513 additional chronically homeless individuals in Denver, according to the 2006 MDHI point in time study. If these costs savings are applied to each of the 513 persons eligible to participate in Denver housing first programs, the associated costs savings over the two year period would amount to $16,182,531.

The following chart shows the average service costs per person and the projections of cost savings for the current 150 housing first program participants and the anticipated cost savings for the 513 chronically homeless persons who could be served through a housing first approach if additional funding was provided to expand the program.

	Average Pre-Entry Costs Per Person	Average Post-Entry Costs Per Person	Average Cost Change Per Person	Projected Savings for 150 Participants	Projected Savings for 513 Participants
Detox	$ 10,373	$ 1,641	-$8,732	-$1,309,856	-$4,479,706
Incarceration	$ 1,798	$ 427	-$1,371	-$205,578	-$703,077
Emergency Room	$ 5,256	$ 3,452	-$1,804	-$270,600	-$925,452
Outpatient	$ 1,747	$ 2,641	$894	$134,100	$458,622
Inpatient	$ 10,378	$ 3,533	-$6,845	-$1,026,676	-$3,511,231
Shelter Costs	$ 13,688	0	-$13,688	-$2,053,125	-$7,021,688
TOTAL	$ 43,239	$ 11,694	-$31,545	-$4,731,734	-$16,182,531

The costs of operating the Denver Housing First Collaborative are $13,800 per person per year for housing and assertive community treatment services. Thus, the total two year costs are $26,800.

When the investment costs of providing comprehensive supportive housing and services are factored in, there is a net cost savings of $4,745 per person. Thus, the total net cost savings for the current in the Denver housing first programs are projected to be $711,734. The projected net cost savings for all 513 chronically homeless persons, if provided access housing first programs, would be $2,424,131.

The following table sets forth projected the net costs savings for the current 150 housing first program participants and the anticipated net cost savings for the 513 chronically homeless persons who could be served through a housing first approach if additional funding was provided to expand the program.

	Average Pre-Entry Costs Per Person	Average Post-Entry Costs Per Person	Average Cost Change Per Person	Projected Savings for 150 Participants	Projected Savings for 513 Participants
Total Emergency Costs	$ 43,239	$ 11,694	-31,545	-4,731,734	-16,182,531
Housing First Costs					
Housing	N/A	$ 10,800	$ 10,800	$ 1,620,000	$ 5,540,400
Services	N/A	$ 16,000	$ 16,000	$ 2,400,000	$ 8,208,000
Total Housing & Services	N/A	$ 26,800	$ 26,800	$ 4,020,000	$13,748,400
Difference	$43,239	$38,494	-$4,745	-$711,734	-$2,434,131

VI. PROGRAM OUTCOMES:

The following outcomes have been documented through the local and national evaluation process for the first two years of the program:

Goal 1. Increase long-term housing options for persons experiencing chronic homelessness, mental illness, and substance abuse disorders.

- The DHFC has created 100 housing opportunities for chronically homeless individuals with multiple disabilities.
- A second Housing First Program has been established providing 50 additional supportive housing units.

Goal 2. Increase housing stability for 75% of program participants.

- 77% of program participants initially housed are still housed in the program
- 80% of participants maintained initial housing for at least 6 months
- 68% of those enrolled in the program for more than one year have maintained their housing for at least one year.

Goal 3. Increase the health and mental health status and quality of life for 65% of program participants.

Note: The local evaluation has followed a subset of participants with assessments at intake and follow-up intervals. Based on this subset of participants, the following has been documented:

- 50% of participants have improved their health status.
- 43% of participants have improved their mental health status
- 15% of participants have decreased their substance abuse
- 64% of participants have improved their overall quality of life.

Goal 4. Assist at least 75% of program participants to obtain employment or public benefits for which they are eligible.

- 34% of participants have obtained SSI, SSDI, VA or OAP benefits through assistance by the program. An additional 21% entered the program with these benefits and continue to receive them.
- 45% of participants have applied for or are in the appeals process for SSI, SSDI, VA or OAP benefits
- 47% of participants are receiving Medicaid or Medicare.
- 15% of participants are employed or seeking employment
- The average monthly income of participants has increased from $185 at entry to $431 currently.

Goal 5. Decrease the use of expensive emergency services.

- The number participants enrolled in the program for 24 months who are using emergency services such as hospitalization, substance inpatient treatment, detox or jail has decreased by 60% since enrollment in program.

VII. NEXT STEPS

The initial DHFC funding continues through January 31, 2007. The program will continue to provide housing and assertive community treatment services to program participants. The local and national evaluations will continue to document progress in meeting the goals of the collaborative. A final three year evaluation is expected to be released in mid 2007.

During the next year, there are three critical activities necessary for continued success of the program. These are:

Transition of Participants to Mainstream Programs: The program will continue the process of transitioning participants who have become stable in their housing and treatment to mainstream service systems. To date, a handful of participants are in the process of transitioning their mental health care to the Denver Mental Health Center. These participants continue to receive their housing assistance through the DHFC. However, the transition of their ongoing treatment to the mainstream systems allows the program to begin serving additional chronically homeless persons on the streets. This is crucial to be able to serve the hundreds of chronically homeless persons still on the streets of Denver.

Securing Continuation Funding: The DHFC was initially funded through a unique collaboration of federal funding partners. These agencies committed three years of funding for services and five years funding for housing. However, the expectation was that continuation funding would be obtained at the local or state level. The project has had numerous discussions with potential funders. However, as of this date, full continuation funding has not been secured. It is critical that such funding be found in order to continue the important work of the collaborative and to help meet Denver's goal of ending homelessness in ten years.

Expand Demonstration Programs throughout Colorado: There is growing interest in communities throughout Colorado to replicate the Denver Housing First Collaborative approach. Agencies in Denver, Fort Collins, Colorado Springs, Grand Junction, Loveland, Aurora and Boulder have begun discussions with the Colorado Legislature about developing a demonstration program in Colorado to continue and expand integrated housing and service programs for chronically homeless individuals through a housing first approach. The cost savings documented in this report should prove useful in demonstrating the need for further expansion of this type of program.

VII. CONCLUSION:

The first two years of the Denver Housing First Collaborative have demonstrated significant progress in ending homelessness for some of the most vulnerable individuals in our community – chronically homeless individuals with disabilities. The challenge of targeting the most difficult to serve population has resulted in promising results of increased housing stability, increased health status, improved mental health, and improved quality of life for the participants. It has also reduced the need for more expensive emergency services in the community, such as hospitalization, detox, and jail, saving significant taxpayer funds.

It is critical to create an ongoing source of funding to continue housing first programs in Denver and to replicate and expand these programs throughout the state.

It is clear that the housing first approach offers tremendous promise for improving the health status of chronically homeless individuals while reducing taxpayer funded emergency costs of emergency room care, hospitalizations, incarceration and detox. Furthermore, the overall quality of life for the community can be significantly improved as the negative impact of individuals living and sleeping on the streets is eliminated.

Downtown Emergency Service Center
515 Third Avenue, Seattle, WA 98104 / www.desc.org / tel: 206-464-1570 / info@desc.org

JAMA research shows housing for homeless saves taxpayers millions

This month, ***The Journal of the American Medical Association*** published research demonstrating the effectiveness of DESC's 1811 Eastlake Housing First program. The lesson for policymakers and practitioners alike is that for this subset of the homeless population, **providing housing and on-site services without requirements of abstinence or treatment is significantly more cost-effective than allowing them to remain homeless.**

Major findings of "Health Care and Public Service Use and Costs Before and After Provision of Housing for Chronically Homeless Persons With Severe Alcohol Problems" (Vol. 301 No. 13, April 1, 2009), an evaluation headed by Dr. Mary Larimer of the University of Washington, included:

- DESC's 1811 Eastlake **saved taxpayers more than $4 million dollars over the first year of operation.** Annual average costs per person while homeless, the year before moving in, were $86,062. By comparison, it costs $13,440 per person per year to administer the housing program.
- Median costs for the research participants in the year prior to being housed were **$4,066 per person per month in publicly-funded services** such as jail, detox center use, hospital-based medical services, alcohol and drug programs and emergency medical services. The monthly median costs **dropped to $1,492 and $958 after six and 12 months in housing, respectively.**
- During the first six months, even after considering the cost of administering housing for the 95 residents in this Housing First program, **the study reported an average cost-savings of 53 percent – nearly $2,500 per month per person in health and social services, compared to the costs of a wait-list control group of 39 homeless people.**
- **Alcohol use by Housing First participants decreased by about one-third.** The median number of drinks for participants dropped steadily from 15.7 per day prior to move-in to 14, 12.5 and 10.6 per day at 6, 9 and 12 months in housing.
- A significant portion of the cost offsets were caused by decreases in residents' use of **Medicaid-funded health services.**

The resident group at DESC's 1811 Eastlake was such a troubled subset of the homeless population that many people claimed these folks didn't want housing, weren't worth trying to help, and would respond poorly to an approach that allowed them to make their own decisions about alcohol consumption.

DESC has known for years through our experience working with highly vulnerable individuals that when we eliminate the chaos of homelessness from a person's life, social and clinical stabilization occur more readily and are more long-lasting. This study confirmed this is true for the residents of 1811 Eastlake.

DESC's 1811 Eastlake—Housing First

Capital Revenue Sources

State Housing Trust Fund	$1.2 M
City of Seattle (housing levy)	$2.2 M
King County	$1.3 M
Federal Low Income Hsg Tax Credit	$5.6 M
Federal HUD	$400 K
FHLB	$520 K
DESC (private funding)	$25 K
TOTAL	**$11.2 M**

Operations and Services - Sources

State DSHS (DASA addiction treatment)	$125 K
Federal HUD-McKinney (homelessness)	$570 K
Federal HUD-Section 8 subsidies	$135 K
Seattle Housing Levy	$50 K
Resident rent	$125 K
Charitable Contributions	$50 K
TOTAL	**$1.0 M**

The Downtown Emergency Service Center provides effective and affordable solutions to homelessness for our community's most vulnerable men and women through a nationally recognized interwoven network of care, housing and support. *For more information, contact Nicole Macri, DESC Director of Administrative Services, 206.515.1514 or nmacri@desc.org. (April 2009)*

FURMAN CENTER
FOR REAL ESTATE & URBAN POLICY
NEW YORK UNIVERSITY
SCHOOL OF LAW • WAGNER SCHOOL OF PUBLIC SERVICE

NOVEMBER 2008

FURMAN CENTER POLICY BRIEF

The Impact of Supportive Housing on Surrounding Neighborhoods: Evidence from New York City

This policy brief is a summary of the Furman Center's research on the effects supportive housing has on the values of surrounding properties. The full study is available at http://furmancenter.nyu.edu.

What Is Supportive Housing?

Supportive housing is a type of affordable housing that provides on-site services to people who may need support to live independently. Residents may include formerly homeless individuals and families, people with HIV/AIDS or physical disabilities, young people aging out of foster care, ex-offenders, people with mental illness or individuals with a history of substance abuse. Residents in supportive housing developments, unlike those in temporary or transitional housing options, sign a lease or make some other long-term agreement. Developments provide a range of services to residents, which can include case management, job training and mental health or substance abuse counseling. Supportive housing developments are run by non-profit organizations that typically provide both support services and management.

Researchers have found supportive housing to be an effective and cost-efficient way to house disabled and formerly homeless people.[1] The combination of permanent affordable housing and support services is seen as key to providing a stable environment in which individuals can address the underlying causes of their homelessness—at far less cost than placing them in a shelter or treating them in a hospital.

[1] See, e.g., Culhane, Dennis, Stephen Metraux and Trevor Hadley. 2002. Public Service Reductions Associated with Placement of Homeless Persons with Severe Mental Illness in Supportive Housing. *Housing Policy Debate*. 13(1): 107 - 163; Lipton, Frank R., et al. 2000. Tenure in Supportive Housing for Homeless Persons With Severe Mental Illness. *Psychiatric Services*. 51(4): 479-486.

WWW.FURMANCENTER.NYU.EDU

Supportive Housing in NYC

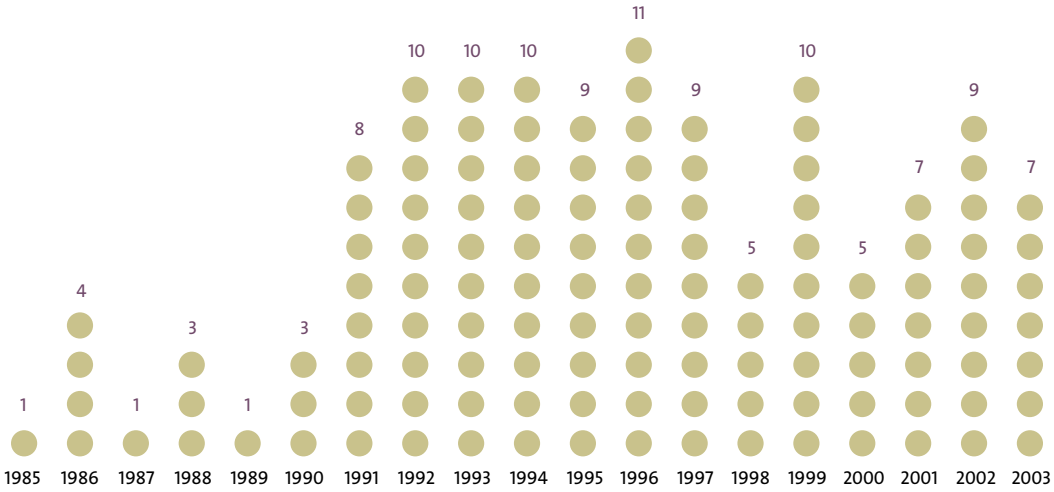
Supportive housing grew out of attempts in the late 1970s and early 1980s to provide services to mentally-ill individuals who were homeless or living in substandard, privately-owned Single Room Occupancy (SRO) buildings. Soon thereafter, nonprofit groups formed to rehabilitate the housing in addition to providing on-site services.

By 1990, New York City nonprofits were operating over 2,000 units of supportive housing. The success of these efforts led the state and city to sign a historic joint initiative to fund the creation of thousands of new supportive housing units for homeless persons with mental illness. The "New York/New York Agreement," signed in 1990, was the first of three initiatives that have helped spur the development of over 14,000 units in more than 220 supportive housing residences in the city for formerly homeless and inadequately housed people with a range of disabilities. As Figure A shows, the overwhelming majority of these developments were built in Manhattan, Brooklyn and the Bronx. As seen in Figure B, there has been fairly steady development throughout the past two decades, with a big building boom following the 1990 NY/NY agreement.

Figure A: Supportive Housing Developments in Our Study by Borough (as of 2003)

Signed in November of 2005, the "New York/New York III Agreement" was the largest yet, committing $1 billion to create 9,000 units of supportive housing (both scattered-site and single-site[2]) for homeless and at-risk individuals and families with disabilities in New York City over ten years. The large scope of this initiative ensures that there

Figure B: Supportive Housing Developments Completed Annually



Note: This figure includes all developments examined in this study: all supportive housing opening in New York City before 2004 that resulted from new construction or the gut renovation of a vacant building.

[2] Our research looks only at the impact of single-site supportive housing (developments in which the supportive housing units all are located in a single building with on-site social services), but it is important to note that New York City has an additional 9,000 supportive housing units that are scattered-site (dispersed within non-supportive housing buildings).

will continue to be a robust development pipeline of supportive housing to house homeless New Yorkers living with mental illness and other challenges.

As providers of supportive housing begin to implement the NY/NY III agreement, however, they are encountering two related and significant obstacles: New York City has a serious shortage of land suitable for building such developments; and community opposition to hosting supportive housing further limits the sites on which supportive housing can be built. The state and city require some form of public notification for all proposed supportive housing developments, and opposition by the local community often makes it difficult or impossible for developments to secure the necessary funding and land use approvals.

Despite the critical role that supportive housing plays in helping to address the problem of homelessness, communities asked to host the housing often resist, expressing fears that the housing will have a negative impact on the neighborhood. Neighbors voice worries, for example, that the supportive housing will increase crime, drain the neighborhoods' services and overburden its infrastructure, bring people to the community whose personal appearance or behavior will make residents and visitors uncomfortable, or otherwise decrease the quality of life in the neighborhood. They also commonly express a concern that supportive housing will depress the value of housing in the neighborhood, thereby depriving them of potential returns on their investment, and triggering a spiral of deterioration.

What Do We Know About Neighborhood Impacts of Supportive Housing?

Theoretically, supportive housing developments could either depress or raise neighborhood property values. If the development isn't well-maintained or doesn't blend in well with the surrounding community, it could have a negative impact on neighborhood property values. Similarly, if the residents of the new supportive housing engage in offensive behavior or participate in or are targets for illegal behavior, the housing might cause prices to drop. On the other hand, if a new development is attractive and replaces a community eyesore, such as an abandoned or vacant property, or helps to house people who otherwise would be living on the streets nearby, it likely would have a positive impact on property values. Similarly, if the new development is a conscientious and good neighbor and provides useful services to the community, it could raise prices.

While some who oppose supportive housing may do so regardless of the facts, objective, credible research about the experiences other neighborhoods have had with supportive housing should help to inform discussions about proposed developments. Some researchers have studied the effects of group homes, but few have looked specifically at the supportive housing model. Moreover, previous studies have been limited by data constraints, including small sample sizes (as few as 79 units) and limited time frames, and have studied effects in low-density neighborhoods, making it difficult to generalize their results to denser urban settings.[3]

The Furman Center's research aims to fill this gap in the literature with a rigorous, large-scale examination of the impacts of approximately 7,500 units of supportive housing created in New York City over the past twenty years.

[3] See, e.g., Galster, George, Peter Tatian and Kathryn Pettit. 2004. Supportive Housing and Neighborhood Property Value Externalities. *Land Economics.* 80(1): 35-54; for studies of precursors to supportive housing such as group homes, see, e.g., Colwell, Peter F, Carolyn A. Dehring and Nicholas A. Lash. 2000. The Effects of Group Homes on Neighborhood Property Values. *Land Economics.* 76(4): 615-637.

About Our Research

In order to measure the impacts of supportive housing on property values, we use a large dataset with information on the sales prices of all apartment buildings, condominium apartments and one to four family homes selling in the city between 1974 and 2005, as well as property-level data on the characteristics of the units sold. We link these data to a list of all the supportive housing developments and their addresses, which we compiled with assistance from the New York City Department of Housing Preservation and Development (HPD), the New York State Office of Mental Health (OMH), the Supportive Housing Network of New York (SHNNY)—the member association of nonprofit supportive housing providers in New York State, and the Corporation for Supportive Housing (CSH)—a financial and technical assistance intermediary to supportive housing providers. This comprehensive dataset includes 7,500 units in 123 developments that opened between 1985 and 2003 and either were newly constructed or the result of gut renovations of vacant buildings.[4] The median size of the 123 developments is 48 units.

Identifying the impacts of supportive housing on the values of neighboring properties is challenging, primarily because it is difficult to disentangle what causes what—to determine whether supportive housing affects neighboring property values or whether neighboring property values affected the decision to build supportive housing in the neighborhood. Developers of supportive housing might, for example, be more likely to build the housing on sites in neighborhoods with very low property values, because more city-owned sites are available in such neighborhoods, because community opposition may be lower in these neighborhoods, or because developers can only afford to build in neighborhoods with the lowest property values. In fact, a simple comparison of census tracts in the city reveals that in 1990, before most supportive housing was sited, tracts that now have supportive housing tended to have higher poverty rates and lower homeownership rates than tracts that do not (see Table A).

Table A: Demographics (as of 1990) for Census Tracts with and without Supportive Housing

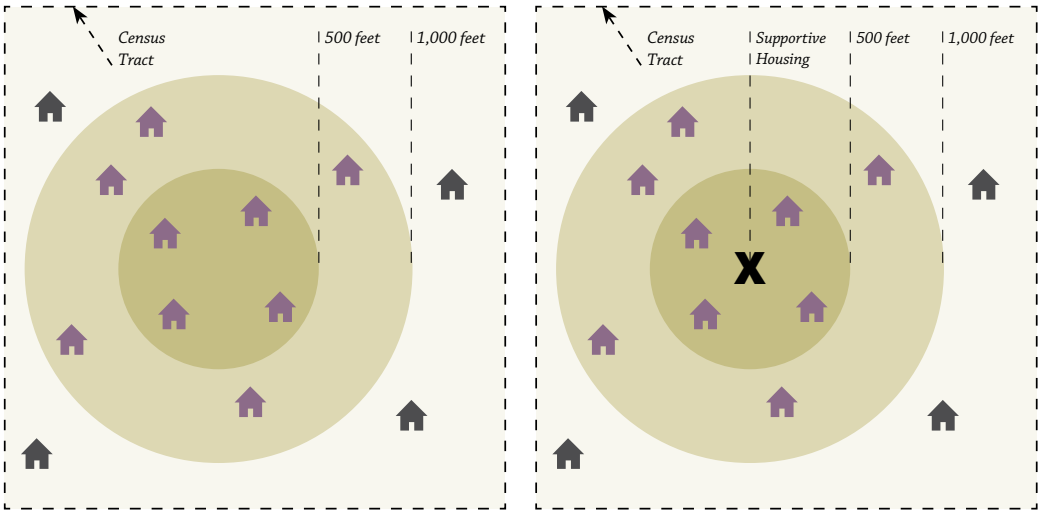
Indicator (as of 1990)*	*All Tracts in NYC*	*Tracts that now have Supportive Housing***	*Tracts without Supportive Housing*
Number of Tracts	2,217	102	2,115
Poverty Rate	19.3%	31.4%	18.4%
Homeownership Rate	28.6%	10.9%	30.5%

Source: 1990 Decennial Census data (NCDB). *All reported numbers represent the mean value across census tracts, weighted by population. **Tracts with supportive housing are those that are host to the 123 supportive housing developments in our study.

[4] Because we are interested in the impacts new developments have on a neighborhood, our data on supportive housing developments only include new construction or projects that involved the complete, physical rehabilitation of a formerly vacant building. We did not include instances where an occupied building received cosmetic rehabilitation or was converted into a supportive housing development without undergoing substantial renovation.

Figure C: Methodology

Supportive housing development is represented by the **X**. *We compare prices of properties within 500 feet and 1,000 feet of the development to similar properties in the same census tract but more than 1,000 feet away before and after the supportive housing is built.*



Price differences between properties inside each ring and those more than 1,000 feet away from the site *before* supportive housing is built.

Price differences between properties inside each ring and those more than 1,000 feet away from the supportive housing *after* it opens.

We address this problem by controlling for the difference between the prices of properties very near to a supportive housing site and the prices of other properties in the same neighborhood before the supportive housing is constructed. Specifically, our research compares the price differences between properties within 500 and 1,000 feet of a supportive housing development, before and after it is built, with a comparable group of properties more than 1,000 feet from the site but still within the same census tract.[5]

Our strategy is illustrated in Figure C. Our approach controls for differences in prices between properties near to supportive housing sites and other properties in the neighborhood before supportive housing is built. It also controls for neighborhood price appreciation over time. Accordingly, we are able to specifically isolate the impact of the supportive housing. Our approach also allows us to examine whether impacts vary with distance from the supportive housing development, because the impact on a property closer to a development might very well differ from impacts on properties still affected but further out in the 1,000 foot ring.

Finally, because impacts might be felt as soon as people learn that a supportive housing development is going to be built, and because construction of any building may bring noise, truck traffic, and other problems, we exclude the construction period from our estimate of property value differences between properties within the ring of supportive housing and those beyond 1,000 feet, before supportive housing opens.

[5] One thousand feet is approximately the length of four North/South streets in Manhattan; across the city, on average, 1,000 feet is about the length of two blocks. While previous property value impact studies have looked at larger distances, it is unlikely that the relatively small developments we study would have an effect on property values many blocks away in the fairly dense Manhattan, Bronx and Brooklyn neighborhoods in which they are concentrated.

What Do We Find?

Our research finds little evidence to support neighbors' fears that supportive housing developments will reduce the price of surrounding properties over time. To the contrary, we find that the opening of a supportive housing development does not have a statistically significant[6] impact on the value of the properties within 500 feet of the development.

We find that two to five years before a supportive housing development opens, properties within 500 feet of the site sell for almost 4 percent less than properties in the comparison group. This indicates that supportive housing developments are generally being built in areas that are more distressed than the surrounding neighborhood.

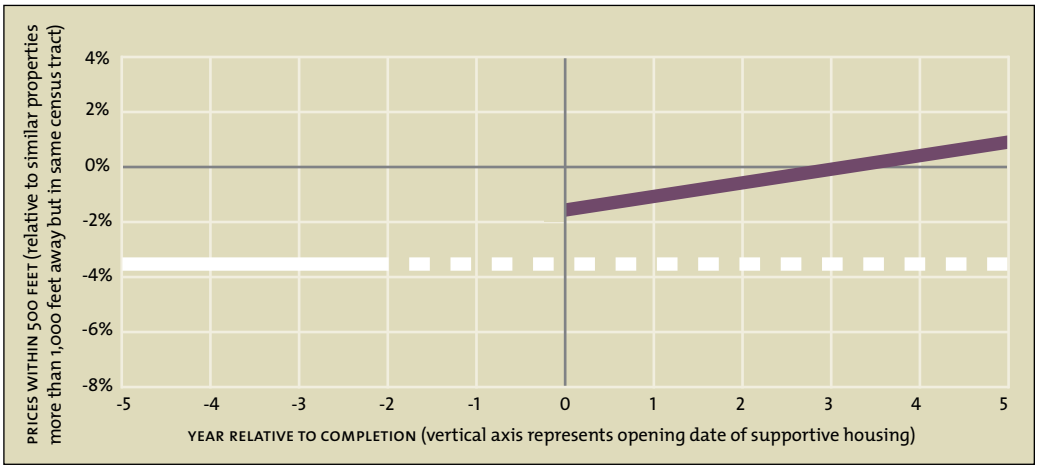
In the five years after completion, we find that the prices of those nearby properties experience strong and steady growth, appreciating more than comparable properties in the same neighborhood but further than 1,000 feet from the supportive housing.

As seen in Figure D, which illustrates the impact of a new supportive housing development of median size (48 units) on properties up to 500 feet away, there is a slight increase in the value of nearby properties when the development opens (compared with their value before construction began), but this difference is not statistically significant. After the supportive housing opens, we see a statistically significant rise in the value of these nearby properties, relative to property values in the comparison group. As a result, the four percent discount neighboring properties experienced before the supportive housing was built steadily narrows over time.

Moving farther away from the development, we find that properties between 500 and 1,000 feet away, unlike those less than 500 feet away, see a statistically significant drop in value when the building is under construction and when the supportive housing opens (compared to prices more than 1,000 feet from the development but within the neighborhood). But once again, we find that prices then show a steady relative gain in the years after completion. That pattern might suggest that the positive effects of the sup-

Figure D: Sales Prices of Properties Within 500 Feet of Supportive Housing Relative to Comparison Group, by Year Relative to Completion (For Median Size Development of 48 Units)

In this figure, the dotted line represents what we estimate would have happened to the prices of nearby properties had there been no new supportive housing development; the solid purple line represents the results of our analysis, which show steady growth in the value of nearby properties.



[6] The term "statistically significant" refers to the likelihood that the differences between the groups being compared (in this study, the difference between the values of the properties near supportive housing and those further away) could have occurred by chance. If statistical methods show that results are statistically significant at the 95 percent level, we can be sure that the probability that the results are due to pure chance is five percent or less. Generally, researchers will consider results reliable only if they are statistically significant at the 90 (or higher) percent level.

portive housing are diluted farther away from the site and initially are outweighed by community uneasiness about the housing, but as the neighborhood grows comfortable with the supportive housing, prices show steady growth relative to the comparison properties.

In sum, our research reveals that the prices of properties closest to supportive housing—which are the properties opponents of supportive housing claim are most likely to be affected by the development—increase in the years after the supportive housing opens, relative to other properties located in the neighborhood but further from the supportive housing. Prices of properties 500 to 1,000 feet from the supportive housing may fall somewhat while the buildings are being built and as they open, but then steadily increase relative to the prices of properties further away from the supportive housing but in the same neighborhood. Our results accordingly suggest that over time, the values of homes near supportive housing do not suffer because of their proximity to the supportive housing.

Does the Size or Type of Supportive Housing Matter? Does the Population Density of the Neighborhood Matter?

Because of the diversity of supportive housing developments and the neighborhoods in which they are being built, we also wanted to evaluate whether characteristics of either the development or the neighborhood influence any effects the development has. We were somewhat surprised to find that the effects on neighboring property values do not depend on the size of the development (number of units) or the development's characteristics, such as whether the development sets aside a certain number of affordable units for neighborhood residents. The impact supportive housing has on property values also does not differ between lower and higher density neighborhoods.

GLASS FACTORY, *a supportive housing development in the East Village, managed by BRC.*

What Do These Findings Mean?

Our findings show that the values of properties within 500 feet of supportive housing show steady growth relative to other properties in the neighborhood in the years after supportive housing opens. Properties somewhat further away (between 500 and 1,000 feet) show a decline in value when supportive housing first opens, but prices then increase steadily, perhaps as the market realizes that fears about the supportive housing turned out to be wrong.

The city, state, and providers of supportive housing must continue to maximize the positive effects of supportive housing and ensure that supportive housing residences remain good neighbors. But the evidence refutes the frequent assertions by opponents of proposed developments that supportive housing has a sustained negative impact on neighboring property values.

JEROME COURT, *a supportive housing development in the Bronx, managed by Palladia, Inc.*

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