King County

Ten-Year Plan to End Homelessness

Begin at Home – Plymouth on Stewart

A Housing First Pilot Project for Chronically Homeless Single Adults

Outcomes of Participants and Matched Comparison

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Mental Health, Chemical Abuse and Dependency Services Division

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Executive Summary

Individuals who are chronically homeless and disabled by mental illnesses, substance use disorders or medical illnesses often cycle between homelessness, hospitals, jails, and other institutional settings. To address these needs, King County, City of Seattle, United Way of King County, and the Seattle and King County Housing Authorities have provided resources for a number of "Housing First" projects characterized by low-barrier access to housing and integrated psychiatric, substance use, and health care services that are voluntary, intensive, and easily accessible. There are no "readiness" or abstinence criteria for individuals to obtain or keep housing, and housing is permanent rather than transitional.

Plymouth Housing Group's Begin At Home (BAH) program provides such a Housing First model with integrated mental health, chemical dependency and primary health care provided within a single, comprehensive team. First-year outcomes for the BAH-Plymouth on Stewart, reported in late 2007, showed marked reductions in acute care service utilization. However, individuals admitted to this program were selected on the basis of very high acute care utilization prior to admission, thus increasing the likelihood that reductions in utilization could be found by chance and expected "regression to the mean". In order to more conclusively evaluate the effectiveness of the program in reducing acute care utilization, we examined participant outcomes relative to a comparison group that also had very high utilization at the time of selection. The purpose of this report is to provide this comparative analysis.

Participants

The 29 BAH participants and 31 comparison group members were selected from two referral sources:

- Adults being released from the Medical respite program with at least $10,000 of expenses at Harborview Medical Center within the prior year ,or

- Individuals who had at least 60 visits to the Dutch Shisler Sobering Support Center (DSSC) within the prior year and who were referred from REACH homeless outreach case managers.

All program participants and comparison group members met the federal definition of chronic homelessness, including having a disabling medical or psychiatric condition.

Participants were predominantly male (72 percent), white (62 percent), and middle-aged (average =51.3 yrs., SD=9.2). Comparison group members did not significantly differ with respect to age (average=50.3 yrs., SD=6.9) or race (65 percent white). However, all comparison group members were male. Both groups met the federal definition of long-term homelessness i.e., 12 consecutive homeless months or four homeless episodes in the prior three years.

Outcome Evaluation Highlights

The program achieved the following, one year after admission/selection:

- Eighty-seven percent one-year housing retention rate, comparable to other Housing First programs nationwide - Housing and Urban Development (HUD) 2007.

- One hundred percent reduction in medical respite days (1,354 fewer days) for participants in contrast to a 68 percent reduction (603 fewer days) for the comparison group. Participants showed a significantly greater reduction in utilization than the comparison group.

- Seventy-four percent reduction in hospital admissions (50 fewer admissions) and 72 percent reduction in hospital days (318 fewer days) for BAH participants. The comparison group reduced admissions by 48 percent (24 fewer admissions) and days by 52 percent (121 fewer days). Participants showed a statistical trend toward greater reduction in hospital admissions than the comparison group.

- Seventy-four percent reduction in emergency department contacts (174 fewer contacts) for participants in contrast to a 26 percent reduction (124 fewer contacts) for the comparison group. Participants showed a significantly greater reduction in utilization than the comparison group.

- Relatively constant jail stays and days for participants and a slight increase for the comparison group. This pattern differed at a trend level between the two groups.

- Ninety-three percent reduction in sobering center contacts (497 fewer contacts) for participants in contrast to a 26 percent reduction (97 fewer contacts) for the comparison group. Participants showed a significantly greater reduction in utilization than the comparison group.

- There was $1,812,779 reduction in service utilization costs for participants ($62,510 per person) and a reduction of $787,954 ($25,419 per person) for the comparison group. The average difference in yearly service cost reductions between participants and control group members was $37,091, which far outweighs the one-year program costs of $18,600 per participant.

Summary and Conclusions

The BAH program showed striking reductions in use of high-cost acute care services, suggesting that a Housing First approach may be particularly worthwhile to stabilize individuals selected on the basis of intensive service needs and/or high service utilization.

The study also underscores the value of employing a well-matched comparison group when evaluating programs selecting participants on the basis of high service utilization. A number of analyses revealed statistical differences between participants and the comparison group despite the small sample sizes and considerable within-group variation that limited power to detect statistical difference. This suggests that the reductions in utilization for BAH participants cannot simply be explained as being a result of chance or "regression to the mean".

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Background

Individuals who are chronically homeless and disabled by mental illnesses, substance use or medical illnesses often cycle between homelessness, hospitals, jails, and other institutional settings. To address these need, King County, City of Seattle, United Way of King County, and the Seattle and King County Housing Authorities have provided resources for a number of "Housing First" projects characterized by low-barrier access to housing and integrated psychiatric, substance use, and health care services that are voluntary, intensive, and easily accessible. There are no "readiness" or abstinence criteria for individuals to obtain or keep housing, and housing is permanent rather than transitional.

The BAH – Plymouth on Stewart was developed and is managed by Plymouth Housing Group (PHG). First-year outcomes for the BAH-Plymouth on Stewart, reported in late 2007, showcased marked reductions in acute care service utilization. However, individuals admitted to this program were selected on the basis of very high acute care utilization prior to admission, thus increasing the likelihood that reductions in utilization could be found by chance and expected "regression to the mean". In order to more conclusively evaluate the effectiveness of the program in reducing acute care utilization, we examined participant outcomes relative to a comparison group that also had very high utilization at the time of selection. The purpose of this report is to provide this comparative analysis.

Purpose of This Report

This report reviews one-year acute care service outcomes for BAH-participants and a matched comparison group

Evaluation Design

The evaluation employed a pre-post comparison group design. The comparison group was selected using the same criteria as the participant group (see Participants on page 6) but one and one-half years later. The original evaluation was conducted for internal program improvement. However, after a year, we obtained approval from the state Department of Social and Health Services Human Research Review Board to obtain data from a comparison group to provide generalizable information and to strengthen results for dissemination.

Data sources included:

- Demographic characteristics of program participants
- Admissions and days in Harborview Medical Center Medical Respite
- Admissions and days in Harborview Medical Center Inpatient Units
- Contacts with Harborview Medical Center Emergency Department

- Admissions and days in inpatient psychiatric hospitals
- King County jail bookings and jail days
- Admissions to the DSSC

Program Description

As noted in the December 2007 report, PHG developed and manages the BAH – Plymouth on Stewart project. The PHG provides permanent supportive housing for single adults who are homeless across King County.

The BAH-Plymouth on Stewart provides a Housing First model that offers low-barrier access to housing and clinical services that are voluntary, intensive, and easily accessible. There are no "readiness" criteria for individuals to obtain housing; individuals are housed directly from living on the streets. Housing is permanent and considered to be the person's home, not residential treatment. Housing units are held for the person for up to 90-day absences. Residents are not required to be abstinent or participate in services to retain their housing. However, easy on-site access to services creates an environment that is conducive to resident participation. The model emphasizes participants being good tenants, and they utilize interventions that target behaviors negatively impacting ability to remain in the community (e.g., managing day-to-day responsibilities of being in an apartment and conflicts with other tenants). Services focus on harm reduction, relapse prevention and recovery associated with mental illness, substance use, and medical conditions. Eviction is seen as a last resort. Tenants hold leases and have full rights and obligations of tenancy.

The BAH-Plymouth on Stewart utilized 20 units at the newly-renovated St. Regis building that were set aside for people with long-term homelessness, chronic medical conditions, and/or chemical dependency. Plymouth on Stewart now has secure access with front door security 24 hours/day seven days/week. Services for BAH integrate mental health, chemical dependency and primary health care into a single, comprehensive team that can address an array of health conditions. Help with applying for and obtaining income and food assistance benefits and development of self-sufficiency capabilities is also provided. BAH used a multidisciplinary team (housing case managers, chemical dependency specialists, a registered nurse available to the whole building) with a 1:21 housing case manager-to participant ratio, frequent case staffing, 24 hour/seven days a week staff coverage, and a small caseload size with almost all services provided in the community or at the person's residence.

Participants

The BAH focuses on providing housing and support for the highly complex problems of individuals being released from the medical respite program, as well as individuals who were frequent users of the DSSC referred from REACH homeless outreach case managers. Medical respite is funded by the Seattle-King County Public Health Department's Health Care for the

Homeless Network, and it provides 24-hour shelter and seven days a week nursing care, social work and medical linkages for homeless individuals who have had acute medical events and need continuing daily nursing care. The types of chronic medical conditions most often treated at medical respite include chronic infections, hepatitis, heart disease, liver disease, hypertension, dental issues, seizures, and tuberculosis. The REACH program, also funded by the Homeless Network, provides intensive case management services to homeless chronic public inebriates in downtown Seattle, for clients who are frequent users of the DSSC (a sleep-off center).

Specific participant eligibility criteria for BAH are:

- Adults age 18 years or older

- Long-term homelessness (12 month consecutive or four episodes in prior three years) with significant disabling condition(s), as per the federal HUD standards for "chronic" homelessness, where significant disabling condition refers to physical and/or psychiatric conditions that significantly impair the functional abilities of the individual and have been likely contributors to periods of homelessness.

- Referral from medical respite with incurred costs within Harborview Medical Center of $10,000 within the past year, or referral from REACH with 60 or more visits to the DSSC within the past year.

The first 20 program participants were drawn into the program from June through August 2006, based on consecutive individuals who met program criteria and were willing to participate. Nearly all (85 percent) were retained in the program for a least one year; however, as individuals left the program, eight newly-admitted individuals were added to the program to fill vacant beds through November 2008 for a total of 29 individuals.

Comparison group members were also drawn from consecutive individuals meeting the same criteria from January through July 2008. However, the comparison group needed to consent to data collection but only had an incentive of a $10 Starbucks gift card rather than the more significant incentive of stable housing and program participation. As such, not every eligible individual consented to be in the comparison group. In particular, the medical respite site had difficulty obtaining consents from their very small women's program due to very short lengths-of-stay and high staff turnover during the study period. We do not have information on the exact number or characteristics of the individuals who did not consent.

Results

Participant and Comparison Group Characteristics

Participants were predominantly male (n=21; 72 percent) and had an average age of 51.3 yrs (SD=9.2). The racial breakdown for participants and the comparison group is shown in Table 1. Comparison group members did not significantly differ from participants with respect to age (average=50.0 yrs., SD=6.9) (t=.61; df=1; n.s.) or race (X^2=3.13; df=1; n.s.). The groups did

differ by gender, with all comparison group members being men (X^2=9.88; df=1; p=.002). This was due to logistical issues within the women's program within the medical respite site at the time the comparison group was recruited, as noted in Participants section beginning on page 6, which reduced the likelihood that individuals from this sub-program would be selected.

Table 1. Ethnicity

Ethnicity	Participants	Comparison Group
White	18 (62%)	20 (65%)
Black	5 (17%)	6 (19%)
American Indian/Alaska Native	4 (14%)	1 (3%)
Hispanic	2 (7%)	3 (10%)
Other	0 (0%)	1 (3%)
Total	29 (100%)	31 (100%)

All participants and comparison group members met the federal definition of homelessness described above. The average duration of homelessness prior to admission for participants was 44.9 months (SD=40.0; range 2-156 months). Data regarding duration of homelessness were not available for the comparison group.

Although participants and the comparison group differed with respect to gender, they did not differ on other demographic characteristics. More importantly, the groups were comparable on prior-year values for key service utilization outcomes as can be seen in analyses below.

Housing Retention

The BAH participants achieved a one-year housing retention rate of 87 percent. Housing retention is a major aim of Housing First programs, so this is a very positive outcome. As part of "usual care," comparison group members could have entered any of a variety of housing situations or remained homeless - data regarding their service and housing disposition following selection were not available for this study.

Medical respite Utilization

As described earlier, medical respite is a shelter based service for people who are homeless. While in respite, clients have regular appointments with a nurse and, if needed, a mental health practitioner, psychiatrist and/or a chemical dependency professional. All respite clients are also linked with a primary care physician during their stay in respite. This intervention alone, if the person continues to see their physician, is likely to reduce utilization of emergency medical services and possibly hospital time as well.

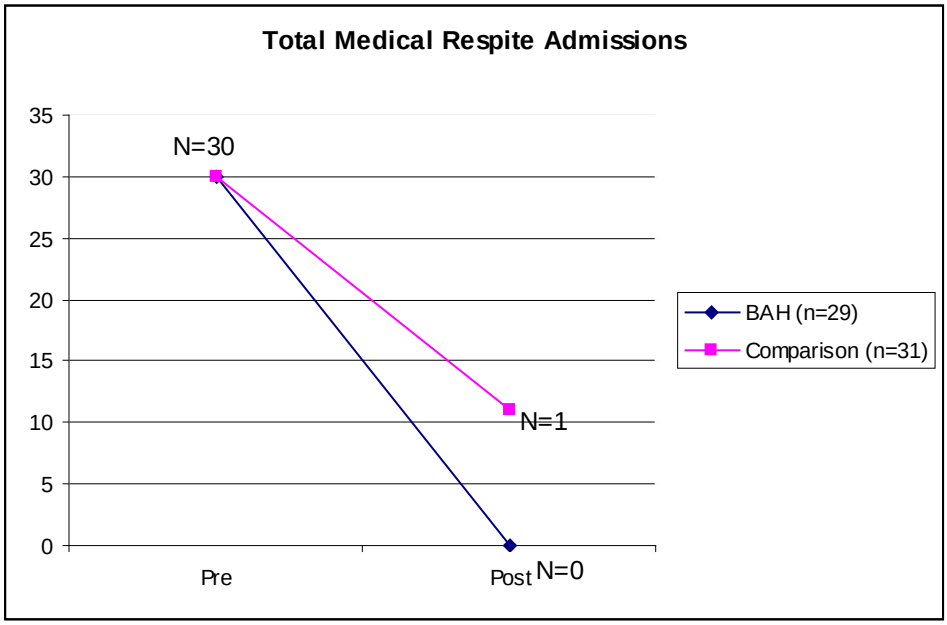
As for respite itself, participants in BAH became ineligible for the program once housed. As such, it is not a surprise that during the year prior to BAH admission, 19 of the 29 BAH participants had 30 stays (1,354 days total) in medical respite and no stays during the year after. Of the 31 comparison group members, 29 had 30 stays (904 days) during the year prior to selection, dropping to ten people having 11 stays (301 days) during the year following selection.

At $230/night, BAH participants reduced use by $311,420. The comparison group began with somewhat fewer days of respite use, but reduced days by 68 percent and costs by $138,690.

Average respite stays were significantly reduced following selection for both the participants ($t=4.8$, $df=28$; $p<.001$) and the comparison group ($t=6.11$; $df=30$; $p<.001$). Respite days were also significantly reduced for both participants ($t=4.8$, $df=28$; $p<001$) and the comparison group ($t=2.7$, $df=30$; $p=.001$).

The pattern of effect (Figure 1) appears to favor the participant group. Indeed, after statistically controlling for average pre-program admissions, the subsequent year average admissions differed significantly ($F=12.01$; $df=1$; $p=.001$) between the participants ($\chi=.00$ $SD=.00$) and comparison group ($\chi=.35$; $SD=.55$). The difference in average respite days between the participant group ($\chi=.00$; $SD=.00$) and the comparison group ($\chi=9.71$; $SD=18.92$) was also significant ($F=6.96$; $df=1$; $p=.01$).

Figure 1. Medical Respite Admissions



Harborview Medical Center Utilization

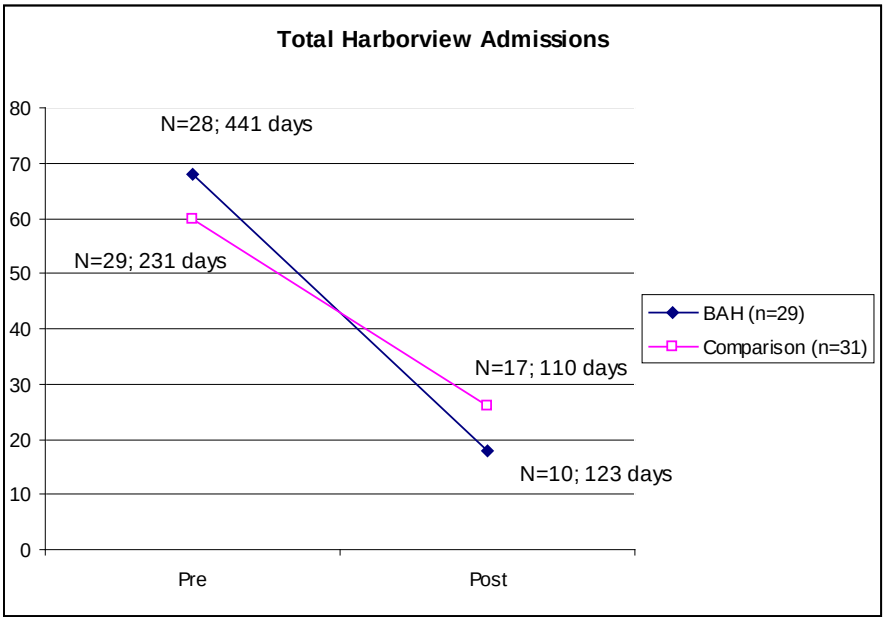
Inpatient

Figure 2 shows Harborview inpatient admissions for BAH participants and the comparison group. Of the 29 BAH participants, 28 accrued a total of 68 admissions (441 days) to Harborview inpatient units during the year prior to program entry dropping by 74 percent to 18 admissions (123 days) among ten people during the subsequent year. Of the 31 comparison group members, 29 accrued a total of 50 admissions (231 days) during the year prior to selection, dropping by 48 percent to 26 admissions (110 days) among 17 people.

There were significant reductions in average admissions following selection for both the participants (t=3.91, df=28; p=.001) and the comparison group (t=3.97; df=30; p<.001). There were also significant reductions in average hospital days for the participants (t=2.74; df=28; p=.011) and comparison group (t=2.23; df=30; p=.033).

The pattern of effect (Figure 2) appears to favor the participant group. After statistically controlling for average pre-program admissions, the subsequent year average admissions differed at the trend level (F=2.75; df=1; p=.10) between the participants (χ=.62 SD=1.05) and comparison group (χ=.84; SD=1.07 for comparison). The difference in average hospital days between the participant group (χ=4.24; SD=11.3) and the comparison group (χ=3.55; SD=5.88) was not significant.

Figure 2. Harborview Inpatient Admissions

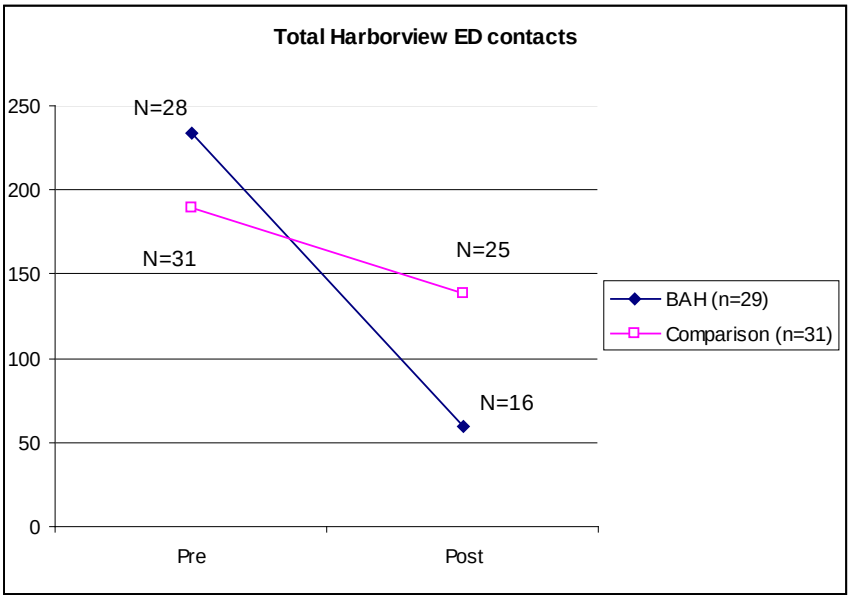


Emergency Department

Figure 3 shows Harborview Emergency Department contacts for BAH participants and the comparison group. Of the 29 BAH participants, 28 accrued 234 contacts during the year prior to program admission dropping 74 percent to 60 contacts among 16 people during the year following BAH entry. All the 31 comparison group members had at least one emergency department contact for a total of 189 contacts during the year prior to selection, dropping 26 percent to 139 contacts among 25 people during the subsequent year.

As with the analysis of admissions, there were significant reductions in average emergency department contacts for both the participants (t=3.49; df=28; p=.002) and the comparison group (t=2.3; df=30; p=.029). Further, after statistically controlling for average pre-program emergency department visits, the average emergency department visits subsequent to admission/selection differed significantly (F=6.49; df=1; p.01) between BAH participants (χ=2.07; SD=4.05) and the comparison group (χ=4.48; SD=6.48).

Figure 3. Harborview Emergency Department Contacts



Charges

Given the substantial decrease in Harborview inpatient and emergency department events, we would expect decreased charges. Indeed, inpatient and emergency department charges for BAH participants were reduced by 72 percent from $2,024,914 to $557,788. Even after removing the two most expensive patients (possible outliers), charges were reduced 63 percent from $1,395,656 to $520,145 for the BAH group. The comparison group reduced total charges by 49 percent from $1,363,908 during the year prior to selection to $689,834 during the following year.

Psychiatric Inpatient Utilization

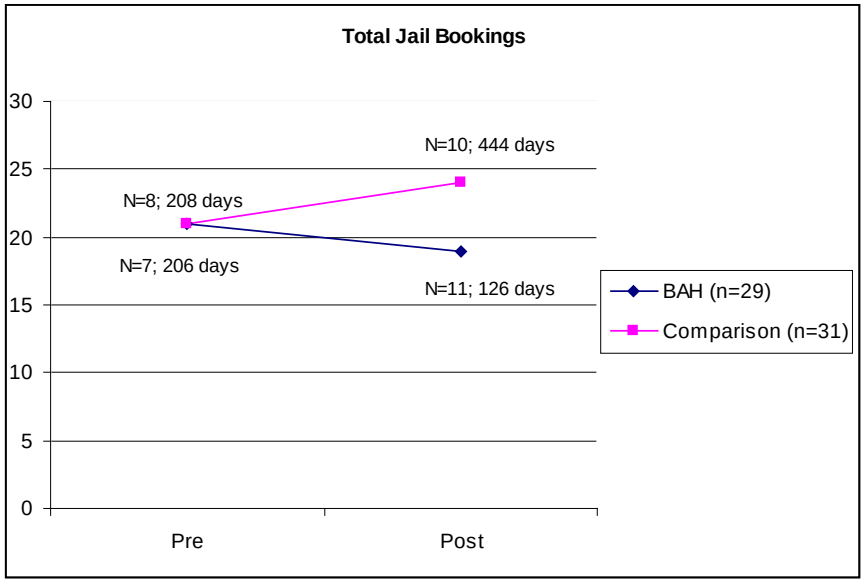
There were very few inpatient psychiatric hospitalizations among BAH participants and the comparison group. The program did not purposefully select individuals with mental illness; however, as shown earlier, three-fourths of the BAH participants and 42 percent of the comparison group had some indication of a mental illness. Only one BAH participant had a psychiatric hospitalization during the year prior to program entry (13 days), and none had an admission during the following year. Similarly, one comparison group member had a psychiatric hospitalization during the year prior to program admission (12 days), and one person had a hospitalization during the following year (four days). No statistical analysis was conducted due to the very low number of admissions.

King County Jail Utilization

Of the 29 BAH participants, seven had at least one jail booking prior to entry into the program (21 total bookings; 206 jail days) and 11 participants had bookings during the following year (19 bookings; 126 jail days) as shown in Figure 4. The comparison group members had an identical total number of bookings and nearly identical number of jail days as the participant group during the year prior to selection (21 total bookings; 208 jail days among 8 people). During the subsequent year, ten people had bookings (24 total bookings; 444 jail days). At $234/booking and $122/night, participants reduced use by $10,228 while the comparison group *increased* use by $29,495.

While neither the participant nor comparison groups showed a statistically significant change in average jail bookings or average jail days between the pre- and post- periods, the pattern of effect appears to favor the participant group. Indeed, analysis showed that after statistically controlling for pre-program jail days and bookings, there was a trend that showed the subsequent year average number of jail days was less for the participants (χ=4.34; SD=13.24) than the comparison group (χ =14.32; SD=36.28) (F=3.29, df=1; p=.08). Average jail bookings did not significantly differ between the participants (χ=.66; SD=1.14) and comparison group (χ=.77; SD=1.50).

Figure 4. Jail Bookings



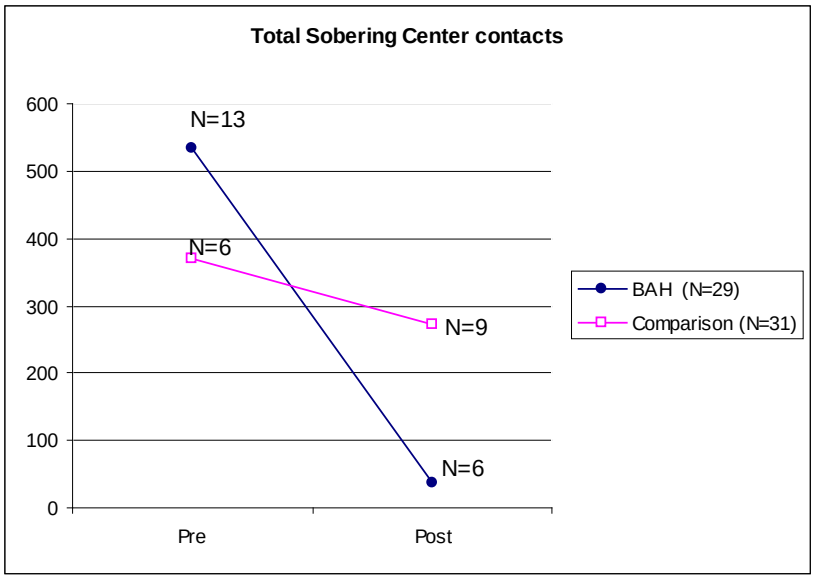
Dutch Shisler Sobering Center Utilization

Thirteen of the 29 BAH participants accrued 533 sobering center visits during the year prior to program entry dropping 93 percent to 36 visits among six people during the subsequent year. The comparison group reduced utilization by 26 percent from 369 visits among six people during the year prior to selection to 272 visits among nine people during the following year. At an

average per contact rate of $48, participants reduced use by $23,856 and the comparison group reduced use by $4,656.

The reduction in the average number of sobering center contacts was statistically significant for participants (t=2.35; df=28; p=.026), but not for the comparison group (t=.51; df=30; p=.61). Further, after statistically controlling for pre-program sobering contacts, the subsequent year sobering contacts showed a significant difference (F=4.41; df=1; p=.04) between the participants (χ=1.24; SD=3.2) and comparison groups (χ=8.8; SD=24.3).

Figure 5. Sobering Center Contacts



REACH Homeless Outreach Case Management

The REACH case management program works with individuals who are homeless to engage them in housing and needed services such as health care, mental health treatment, and chemical dependency treatment. As medical respite, these interventions may reduce hospitalization and jail use regardless of whether an individual is placed in housing. Once an individual is housed, a REACH case manager will continue to work with the individual over months, or even years, if they feel that housing stabilization support is still needed. As such, we have no expectation that, once housed, either BAH participants or comparison group members would reduce their use of REACH. Indeed, the same 12 BAH participants utilized REACH during the year prior to and subsequent to enrollment, although the number of contacts did drop from 432 to 291. Three comparison group members had 41 REACH contacts during the year prior to selection, rising to five people (three were the same as during the year prior) who had 85 REACH encounters during the subsequent year. Because the numbers of individuals using REACH services was so small, and we do not have a hypothesis of service reduction, we did not conduct statistical tests of change over time or between groups.

Summary

The BAH program successfully implemented a Housing First model with no "readiness" or abstinence criteria to access housing, rapidly housing 20 individuals directly from being homeless. The program provided assertive engagement and integrated on-site mental health, chemical dependency, and primary health care services with a 1:21 housing case manager-to-participant ratio.

The 29 participants and 31 comparison group members were selected on the basis of meeting the federal definition of "chronic homelessness" and having incurred high hospital costs or having had high utilization of the sobering center. The groups were comparable with regard to most demographic characteristics and baseline service utilization.

In addition to a high rate of program retention at one year, BAH participants showed striking reductions in utilization of high-cost emergency medical, sobering center, and medical respite services. Utilization reductions were significantly greater for participants relative to the comparison group. Jail days increased for the comparison group while remaining relatively steady for participants. This pattern differed at the trend level between participants and the comparison group. Only a small proportion of participants and comparison group members were involved with REACH homeless outreach case management services, and these individuals remained engaged with REACH for stabilization support after being housed.

Reductions in service utilization were associated with reduced outlay of $1,812,630 for participants (or $62,504 per person) and $787,925 (or $25,417 per person) for the comparison group. These reductions in service utilization would appear to far outweigh the program costs of $372,000 annually (or $18,600 per person for the 20 available slots). It should be noted that the cost figures we used do not represent "true costs". For example, the cost of running a hospital or jail are not reduced if a small proportion of people use it less – the facility staffing and overhead costs remain the same. We used paid claims figures for hospital and emergency department visits, and again, these figures are different, and generally somewhat less than billings, and certainly less than actual costs. Similarly, some "cost" figures (e.g., sobering center) were simply based on the total funding provided to the program by contract divided by the number of people who used the service over a given year. As such, these "costs" would clearly vary over time depending on the number of people who used the service. Additionally, there are ancillary costs not accounted for by these analyses, such as court and police costs. Finally, the program costs of $372,000/year only represent operating costs, not capital costs to develop the units.

With these caveats in mind, it is nevertheless notable that participants showed such substantial reductions in service utilization. A number of analyses revealed statistical differences between participants and the comparison group despite the small sample sizes and considerable within-group variation that limited power to detect statistical difference. Further, some of the comparison group members may have entered housing or supportive housing sometime during the year under study, which makes finding significant incremental differences between the participants and comparison group even more remarkable. This suggests that the reductions in

utilization for BAH participants are attributable to the BAH program itself and cannot simply be explained as being a result of chance or "regression to the mean".

Conclusions

The positive findings from the BAH project -- particularly the remarkable reductions in use of high-cost acute care services -- suggest that a Housing First approach may be particularly worthwhile to stabilize individuals selected on the basis of intensive service needs and/or high service utilization. The study also underscores the value of employing a well-matched comparison group when evaluating programs selecting participants on the basis of high service utilization.

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