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## Changes in the health status of newly housed chronically homeless: the Alaska Housing First program evaluation

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### ABSTRACT

The Housing First (HF) model is an evidence-based supportive housing initiative that provides permanent housing for the homeless without preconditions such as sobriety or treatment compliance. This three-year longitudinal study investigated the effects of Alaska's inaugural Housing First projects in Anchorage and Fairbanks on local service usage, costs and tenant quality of life (QoL). A total of 94 tenants participated at baseline in the QoL study and 68 continued to follow-up. Cost data was collected from local municipalities, Alaska Department of Corrections, and local hospitals, health care clinics, behavioral health providers, and detox facilities. Emergency services use by tenants decreased from the year before moving into Housing First to the year after. Changes in health care costs were more variable depending on site and type of service.

### ARTICLE HISTORY

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### KEYWORDS

Homelessness; housing; harm reduction; quality of life; evaluation; costs

### Introduction



The Housing First (HF) model is an evidence-based supportive housing initiative that provides permanent housing for the homeless without preconditions such as sobriety or treatment compliance. Harm reduction is one of the central tenets of HF, and as such there is emphasis on pragmatically reducing the adverse consequences of substance abuse and psychiatric symptoms by providing safe and affordable housing with minimal admissions requirements (Inciardi & Harrison, 2000).

Housing First stands in contrast to a more traditional or stepwise model of care that requires sobriety, or engagement with treatment as a pre-condition for housing. In the HF model a robust array of non-mandatory services such as case management, physical and mental health services and substance abuse treatment are offered to but not required of the tenant. Providing permanent, affordable housing without preconditions can promote a sense of home, safety, security, privacy, and valued membership in a community (Padgett, 2007; Pearson, Montgomery, & Locke, 2009). In randomized control experiments, participants assigned to Housing First sites without treatment prerequisites remained housed longer and participated in more treatment than participants who had no housing, or had housing only as a condition of treatment (Tsemberis, Gulcur, & Nakae, 2004; Veldhuizen et al., 2015).

Housing First models have been implemented across diverse geographic and demographic settings,

in both project based and scattered site configurations. In Seattle, Washington, the Downtown Emergency Service Center (DESC) 1811 program offers a project-based Housing First site for chronically homeless individuals with alcohol use and co-occurring severe mental illness (SMI). Several peer-reviewed studies conducted by DESC have shown the efficacy of Housing First approaches (Clifasefi, Malone, & Collins, 2013; Collins, Clifasefi, et al., 2012; Collins, Malone, & Clifasefi, 2013; Mackelprang, Collins, & Clifasefi, 2014; Pearson et al., 2009). Over the course of a two-year evaluation, participants decreased alcohol use, despite living in a project-based Housing First facility that permitted alcohol consumption (Collins, Malone, et al., 2012).

The body of evidence supporting the Housing First model is not without critics. Especially important in this criticism is the notion that costs and cost savings have not always been accurately accounted, the length of time used to measure program impact has been relatively short, that affordable and available housing for such programs is limited in many areas, and the individual program applications have not been structured in a way that fits the specific needs of the population being served, particularly youth and veterans (Larimer et al., 2009; Westermeyer & Lee, 2013). Numerous long-term peer-reviewed studies conducted at Housing First sites internationally have sought to reduce this criticism by demonstrating shifts in both service use patterns (i.e. reductions in acute emergency and

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correctional care) and public costs, as well as highlighting the need for clinical staff to support individual clients on-site (Culhane, Metraux, & Hadley, 2002; Gulcur, Stefancic, Shinn, Tsemberis, & Fischer, 2003; Kertesz, Austin, Holmes, Pollio, & Lukas, 2015; Kertesz, Crouch, Milby, Cusimano, & Schumacher, 2009).

### ***Housing First in Alaska***

In 2009, the State of Alaska commissioned a 10-year plan to confront the growing issue of homelessness (Alaska Council on the Homeless, 2009). The plan focused on three general approaches to homelessness; two were preventative in nature and the third was the creation of supportive housing targeted at those who have been historically difficult to house. This chronically homeless population included high consumers of emergency, correctional and acute care services who experienced substance use disorder and frequently had co-occurring severe mental illness. A project-based Housing First approach was identified as the best means of reaching this vulnerable population and achieving the goal of providing permanent supportive housing.

Two Housing First facilities were planned for Alaska; one in Anchorage and another in Fairbanks. The first project-based Housing First apartments in Alaska, Karluk Manor, opened in November of 2011 in Anchorage operated by the Rural Alaska Community Action Program (RurAL CAP). South Cushman, the Housing First facility in Fairbanks, opened in May 2012, operated by the Tanana Chiefs Conference. The DESC 1811 site, along with the New San Marco Housing First apartments in Duluth, Minnesota, provided the models from which Karluk Manor and South Cushman were developed.

Both facilities are converted hotels each with approximately 45 studio apartments, laundry facilities, lobby, dining room, group activity room and sheltered smoking area. Tenant rent is determined on a sliding fee scale based on ability to pay. Formal case management is provided on-site at South Cushman. Each tenant is assigned to one of the two case managers who work at the facility, although participation in services is not mandatory for tenants to remain housed. While participation in services is not a condition of housing, it is encouraged through frequent staff interaction with tenants. Case management at Karluk Manor was provided by a local non-profit service provider, Anchorage Community Mental Health Services. Not all tenants were engaged with case management. Two full-time Housing Services Specialists are employed at Karluk Manor, and provide many services including transportation, medication monitoring, and some mild alcohol and money management on a case-by-case basis.

There is a need to understand how HF programs achieve, or struggle with certain outcomes, and to

understand which components are critical and which may need to be adapted. This is particularly important when HF is introduced into a new community context. As such, this evaluation reports on the results of a three-year longitudinal study to investigate the effects of Alaska's inaugural Housing First project-based endeavors on local service usage, costs and tenant quality of life.

### **Methods**

The Alaska Housing First evaluation consisted of two parallel and linked evaluative processes – a quality of life (QoL) study and a Cost analysis.

#### ***QoL methods***

Tenants were recruited for participation in the QoL study in 2012 following the opening of each of the two Alaska HF facilities. At baseline, tenants participated in a semi-structured life history interview and a structured health survey. The baseline interview followed a life history model, and the survey included questions about demographics, health conditions, and alcohol consumption habits. Twelve to 18 months after moving into the HF facilities, tenants were approached for a follow-up semi-structured interview and survey. The follow-up interview focused on the effect of HF on tenant lives including changes in substance use, social connection, and service use. The follow-up survey was identical to baseline with the addition of community integration questions.

Participants were consented at both baseline and follow-up, and were compensated with a \$20 gift card to a local store for each evaluation activity they completed. The protocol was reviewed and approved by the University of Alaska Anchorage Institutional Review Board.

#### ***QoL analysis***

Interview transcripts were analyzed in two phases using N\*Vivo 10 qualitative data analysis software. After familiarizing themselves with the data, the project team selected three *a priori* codes – substance use, social connectedness, and wellbeing – to identify transcript segments with the most substantive and relevant insights from the observations offered by tenants during semi-structured interviews. The team further augmented the coding structure hierarchically to incorporate several emergent codes that provided additional dimensions of meaning. Two investigators reviewed and coded each transcript segment using these emergent codes. The project team met frequently to assess inter-rater reliability between coders, and to discuss any revisions to the codebook and analytic protocol. The team assessed inter-rater reliability using Cohen's

kappa, and maintained a kappa coefficient of 0.80 or greater between all coders. Any kappa score lower than 0.80 resulted in a discussion and reconciliation of coding differences.

Survey results were analyzed using the Statistical Package for the Social Sciences Version 19 (SPSS) data analysis software systems. Chi-squared or Fisher's exact tests were used to assess differences between Karluk Manor and South Cushman. The related samples Wilcoxon signed-rank test was used to assess differences over time, matching each tenant's baseline and follow-up data. A significance level of  $P \leq 0.05$  was used for all tests. Given limitations on sample size, the study was not powered for subgroup analyses based on age, race, gender, or time living on the street. Statistically significant differences between HF sites are noted when they were detected, but the study was not powered to conduct between-site comparisons.

### Cost evaluation methods

The Housing First Cost Evaluation used a retrospective review of existing administrative data to collect information on health care and social service utilization and associated costs during the year before and two years after tenants moved into the Housing First facility. Agencies that provided services to tenants were initially identified through the QoL interviews and surveys. Agencies were then contacted to discuss the study and determine necessary internal review requirements. Tenants were recruited and consented separately for the Cost Study and participation did not depend on participation in the QoL study. Each participant signed a release of information form that listed all of the agencies that had agreed to participate. Service providers were asked to report the date, type of service, and cost for each service provided to each tenant during the specified time period. Providers did not provide information about diagnoses, treatment, or outcomes. Service providers included the police, fire department, community service patrol, safety center, jail, homeless shelters, hospitals, health clinics, mental health providers, and alcohol or drug detox and treatment centers. As an incentive for participation, each tenant was given a \$10 gift card and a gift bag with personal hygienic items, such as socks, toothbrush, toothpaste, and shampoo.

Service use and cost data were aggregated by month and entered into an internal database using 100% double entry verification to ensure accuracy. Monthly data for each tenant and each service provided were then aggregated into the year before and the first and second year after moving into Housing First.

Service providers in Anchorage provided data for 2011 through 2013 while service providers in Fairbanks provided data for 2011 through 2014. Depending on the move-in date, some tenants had fewer than 12

months of data during the year before moving in or during the second year after moving in. To account for these differences, we annualized the data by calculating the average monthly cost for each tenant for each year and multiplying that number by 12 to get an annual cost. Yearly totals were compared between facilities using t-tests and repeated measures analysis of variance was used to compare costs across the three years for the two facilities combined and separately. Throughout the Service Use and Cost Study results section, Year 1 refers to the 12 months before moving into a Housing First facility, Year 2 refers to the first 12 months after moving in, and Year 3 refers to the second 12 months after moving in.

## Results

### Quality of life study

Eighty seven tenants completed a baseline health survey. Tenants ranged from age 24 to 66, with 67.8% aged 50 or older. Most tenants were male (65.5%), and 69.0% had at least a high school diploma or GED. There was no statistical difference between education levels among the tenants of Karluk Manor and South Cushman. Most tenants were born in Alaska (Table 1).

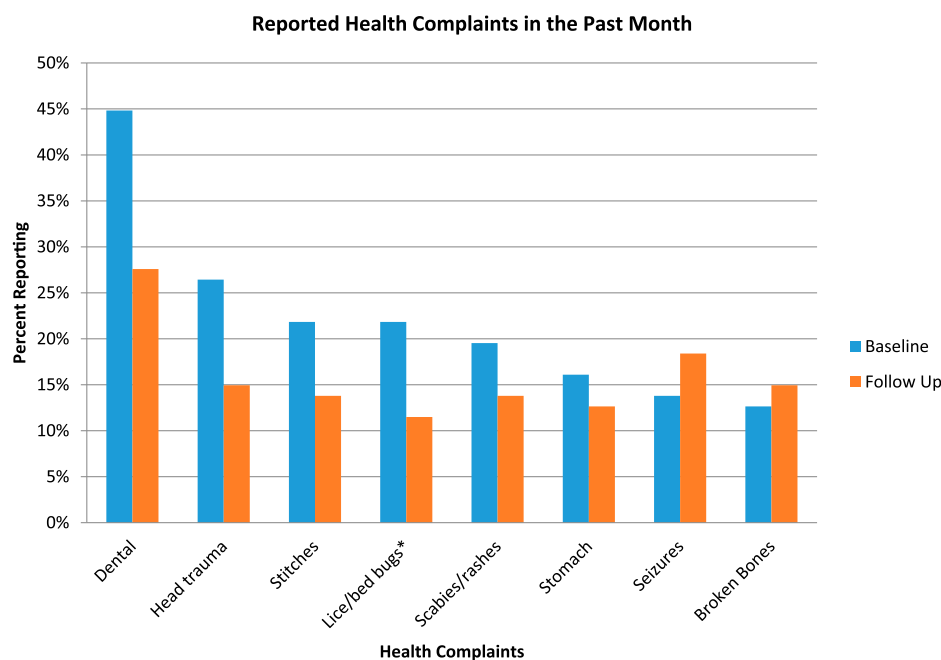
### Physical health

During baseline data collection, tenants reported whether they had ever been told by a health care professional that they had specific health conditions. Post-traumatic stress disorder (PTSD) was reported by 54 tenants at baseline (62.1%), followed by high blood pressure ( $n = 43$ ; 49.4%), depression/bi-polar disorder ( $n = 29$ ; 33.3%), and Seizures ( $n = 25$ ; 28.7%).

At baseline and 12–18 months later at follow-up, tenants were asked what health problems they have experienced in the previous 30 days. The 30 day prevalence of most health problems diminished from baseline to follow-up although these declines were only statistically significant for lice/bed bug complaints ( $P = 0.033$ ) (Figure 1).

**Table 1.** Baseline demographics for quality of life study.

Characteristics	Tenants (N = 87)	
	Number	%
Male	57	65.5
Female	30	35.7
Age		
18–39 years	10	11.4
40–49 years	18	20.7
50–59 years	45	51.7
60 years or older	14	16.1
Education		
Some high school	27	31.0
High school diploma or GED	37	42.5
Some college or 2 year degree	21	24.1
4 year college degree or higher	2	2.3



**Figure 1.** Reported health complaints in the past month, at baseline and follow-up. \* indicates  $P < 0.05$ .

When asked about their health experiences in concurrent semi-structured interviews, tenants augmented their survey responses to report both acute and chronic pain. At follow-up, a higher percentage of tenants report experiencing pain in the past month than those at baseline ( $P = 0.013$ ). Despite an increase in the number of tenants reporting pain, the average level of pain was lower (6.5–5.0 on average, scale 1–10). In follow-up interviews, 18 tenants talked explicitly about chronic pain, describing the numbing effects of alcohol, efforts to remain sober in spite of physical pain, and in some cases, frustration at being denied access to strong pain medication. One tenant described their efforts, “I only drank one time and I haven’t been drinking, so now, I would say I’m feeling better, but now I’m finding all these aches and pains.”

Tenants also listed which health services they had visited in the past six months, at baseline and follow-up. There were significant declines at follow-up in the number of physical exams (from 76.6% to 53.6%), emergency room visits (60.9–42.9%), MRI/CT scans (43.8–30.4%), and other unspecified clinical encounters (21.9–5.4%). There were slight increases in visits to preventative care services, such as dentist, eye doctor, and ear/hearing clinic, although these were not statistically significant.

Using a modified medication adherence scale, tenants reported a significantly higher adherence to prescribed medication regimes ( $P = 0.007$ ). While medication adherence is not a condition of housing and all medications are self-administered by tenants, staff actively encourage adherence, store all medications in a locked central location and track daily medication intake. Tenants described being grateful

for the help with their medications. In the words of a tenant,

They get the medication here and I come in twice a day, once in the morning, once at night to take my meds. That’s when I’m prescribed to do it. Sometimes I forget. Sometimes they remind me to do it. But I try to keep on a certain schedule, a certain time.

### **Mental health**

Tenants were asked non-clinical questions about their mental health as part of the quality of life evaluation. Tenant described their mental wellbeing in terms of grief, therapeutic drugs, having a place to sleep securely and their goals for the future.

Grief from losses throughout tenants’ lives was discussed in a majority of tenant and staff interviews both at baseline and follow-up, but at follow-up tenants appeared less overwhelmed by it. The death of friends and family was addressed in survey responses, and often brought up when tenants were asked about their mental health. At follow-up 38% of tenants reported they were currently grieving, with no significant difference between sites. There were significantly more reports of difficulty in moving on from the loss of a friend or loved one at South Cushman than at Karluk Manor ( $P = 0.002$ ). Twenty-three percent (23%) of Karluk Manor tenants and 59% of South Cushman tenants reported that they felt like they could not move on with life a year or more later. Despite these reports of grief, tenants reported an improvement in overall mental welfare. As one tenant described it,

You know, it’s not so much the physical thing, it’s a mental thing. I feel better mentally. My physical is – I’m getting old. I’m 55. I’m starting to get old. It’s



the mental state of mind is what's keeping me going. Because when you are out there, you know, a mental state, all you're thinking about is survival, surviving one day to the next. And what people do, they do drugs and drink alcohol to suppress the mental state of mind. Do you understand what I'm saying?

In follow-up surveys, compared to baseline, a significant number of tenants reported less time feeling depressed, less difficulty doing activities requiring concentration or thinking; less time spent feeling nervous, anxious, or worried; more time enjoying activities; and more time feeling cheerful or lighthearted ( $P < 0.05$ ). Between baseline and follow-up interviews, tenants described symptoms of depression and anxiety in different contexts. One tenant described stress in this way, "My stress level done went down 'cause I know I got a place to come and be safe, be warm." While tenants still reported anxiety at follow-up, it no longer focused on survival and safety issues, such as a finding place to sleep, eat and avoid assault.

Finding somewhere safe to sleep is difficult when homeless. Some tenants described drinking in order to get access to detox or "sleep-off" centers. Tenants also described walking through the night in an effort to stay warm, rather than stay in one place and risk freezing to death. In follow-up interviews, staff members emphasized improvement in tenant's quality of sleep. However, some tenants described the difficulty of sleeping in the HF facility when their neighbors are drinking and being loud, perhaps yelling, banging on walls, playing music or slamming doors.

At baseline, tenant goals included acquiring job skills, employment and various expressions of "being a person again." At follow-up, goals had shifted to

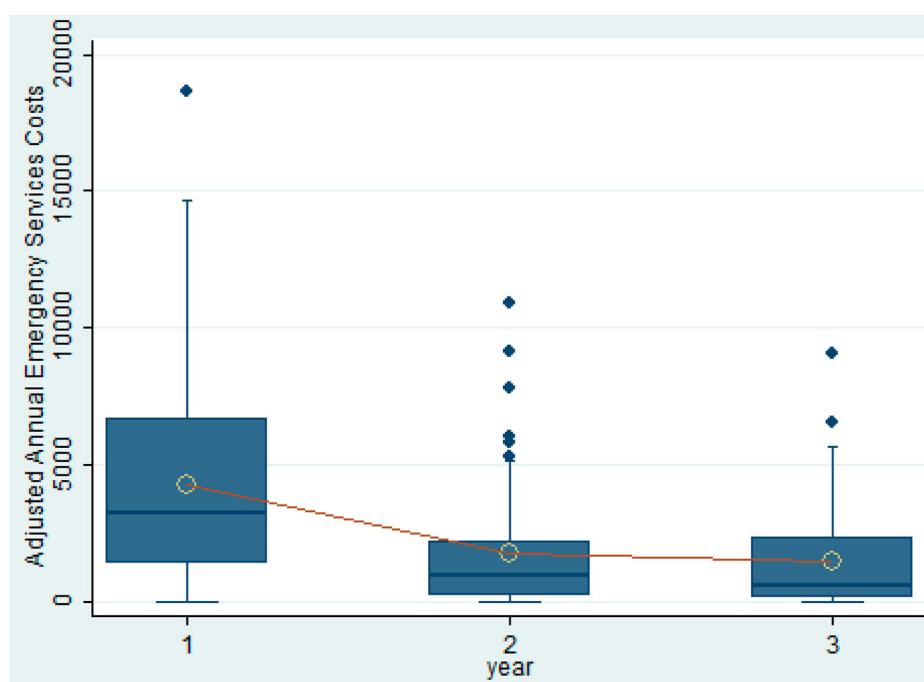
emphasize sobriety or a reduction in drinking, staying alive, as well as moving on to an independent apartment or obtaining educational or vocational training. The goal of moving out was most often linked to the ability to host family and friends without regulation, and was often cited in relation to both site's restrictive visiting policies.

At South Cushman, more tenants retained a goal of employment at follow-up and commented less on moving out. At Karluk Manor, more tenants were identified as handicapped and unable to work, and expressed nostalgia for previous jobs and wished for employment. Others, who had no inhibiting disability, described plans for employment in the immediate future. One tenant who maintained sobriety in Housing First for over a year commented, "I'm looking for a job right now ... I had a couple interviews already ... I'm really excited. I'm applying for more jobs, just in case". Their long-term goal is to leave Housing First and obtain a house so that her kids will be able to visit.

### Substance abuse

Substance use at Housing First in Alaska predominantly concerns alcohol, though researchers also encountered tenant reports of marijuana use, and previous use of the range of drugs called "Spice." Here we report drinking patterns, perceptions of the project-based Housing First environment on tenant drinking, tenant patterns of engaging with treatment and tenant consumption of other drugs.

At baseline, approximately half the tenants (51%) reported drinking daily with only 7% reporting drinking less than once a week (Figure 2). Mean daily



**Figure 2.** Per tenant annual costs for emergency services (in 2011 dollars).

consumption at baseline was estimated to be 12.5 standard drinks. The vast majority (86%) of tenants reported drinking more than eight standard drinks on a typical drinking day at baseline with 49% consuming between one and two fifths on a typical drinking day.

In baseline interviews, alcohol was consistently mentioned in concert with interactions with friends on the street, stress, and trauma. Staff interviews emphasized the universality of trauma in tenant life stories. Drinking to intentionally blackout was reported in multiple interviews. Tenants described drinking in response to stress, and as a way to nullify negative feelings.

At follow-up, prevalence of daily drinking declined to 31% and prevalence of drinking less than once a week increased to 16% (Figure 3). Quantity of alcohol consumed, also decreased with mean consumption per drinking day estimated to be nine standard drinks.

At follow-up, 43% of tenants reported drinking less frequently while only 14% reported drinking more frequently. Of those, many reported that when they do chose to drink, they consumed less.

Tenants who reported reducing their drinking at Housing First were often those employed at Housing First or in day labor off-site, who also reported positive relationships with staff, had family who supported their sobriety and expressed a personal desire to be sober. Tenants who reduced their drinking credited a combination of social support, from staff, family and sometimes friends, as well as personal determination. Those who reported drinking more at follow-up were less likely to be employed and reported less personal connection with staff. Those who reported increasing their drinking described being influenced by friends and neighbors who drink at Housing First, and lower engagement with staff and counseling services.

Social connection was also important when tenants discussed engaging in any kind of treatment, whether AA meetings, outpatient counseling or residential treatment. Barriers to engaging with treatment included anxiety at meeting new people, a belief that treatment is ineffective, resistance to rules involved in treatment, and low levels of engagement with counselors. Illegal activity, including possession and use of

intoxicants other than alcohol, is prohibited and grounds for eviction. At the time of follow-up, no evictions for hard drugs had occurred at either site.

### Service use and cost study

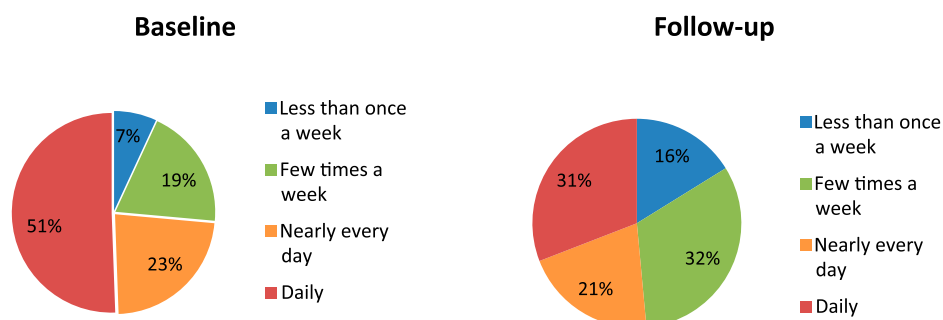
Current tenants at the two HF facilities were eligible for the Cost Analysis if their move-in date allowed for at least 18 months of follow-up after moving in. In Anchorage 23 of the 31 (74%) eligible tenants agreed to participate in the study while in Fairbanks 31 of the 47 (66%) eligible tenants agreed to participate.

### Emergency and legal services

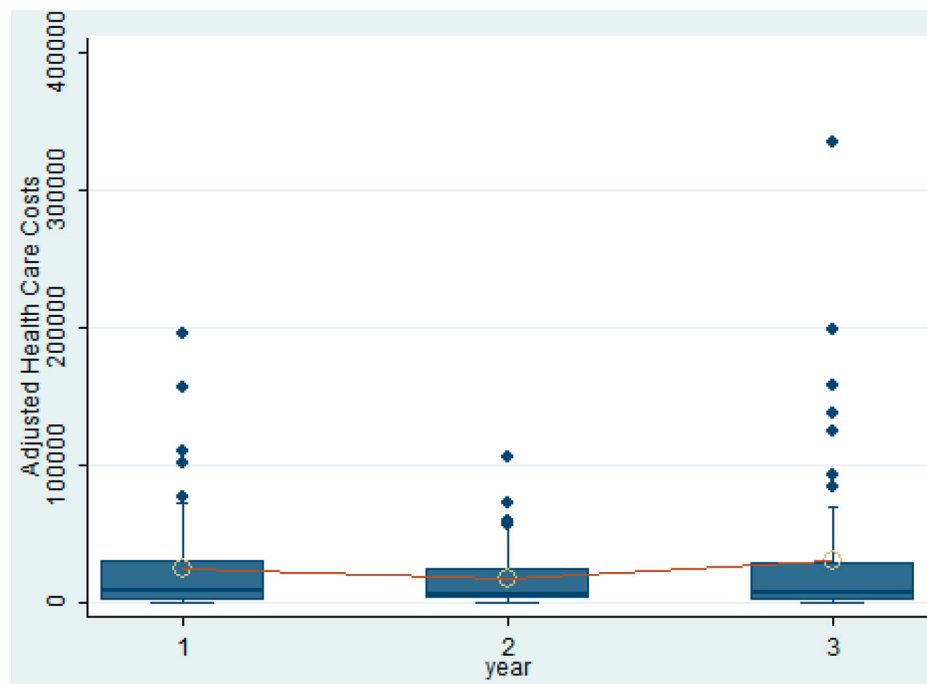
Emergency services included in this report are police and fire department encounters, community service patrol pick-ups and nights spent in the sleep off center, and shelter nights. Legal services refer to nights spent in state department of corrections facilities. Tenant survey and interview data indicated frequent use of emergency services at baseline. Tenants often relied on emergency services for housing and medical care, including sleep off center pick-ups and emergency shelters. As tenure at Housing First increased, tenants often reported decreased reliance on emergency services as a direct result of having a safe, warm place to stay.

Based on data provided by the Anchorage and Fairbanks municipalities, in the 12 months before the tenants moved into the Housing First facilities in Anchorage and Fairbanks, a total of \$225,428 was spent on emergency services for the 54 tenants in the study, \$112,412 for 23 tenants in Anchorage and \$113,016 for 31 tenants in Fairbanks. On average, the communities paid \$4175 per tenant for emergency services in the year before they moved into Housing First, with a median cost of \$3218. These figures dropped to \$94,450 (mean \$1749, median \$920) in the first 12 months after moving in and then \$81,670 (mean \$1513, median \$587) in the second 12 months after moving in.

Figure 4 shows the annual total emergency services cost per tenant during the three years of the study, adjusted to 2011 dollars. The circle indicates the mean, the middle blue line indicates the median, the



**Figure 3.** Frequency of consumption of alcohol at baseline and follow-up.



**Figure 4.** Per tenant adjusted health care costs, both facilities combined.

rectangle indicates the interquartile range (25–75th percentile), and the diamonds indicate values above the 75th percentile. The annual total emergency services cost per tenant during the first year of the study, the 12 months before tenants moved into Housing First, is significantly higher ( $P < 0.0001$ ) than during the second year of the study, the 12 months after moving into Housing First, while the difference between years two and three is not. There was no significant difference between facilities ( $P = 0.39$ ).

The Alaska Department of Corrections (DOC) provided a count of the number of jail nights per month for each tenant during the 12 months before moving into Housing First (Year 1) and the first 24 months after moving in (Years 2 and 3). DOC costs were calculated based on a nightly cost of \$136. The total number of jail nights for HF tenants in the year before moving into a HF facility was 378 in the year before moving into HF to 317 in the first year after and 224 in the second year after moving in to HF. We were unable to determine how many of these jail nights were due to sentences issued prior to moving into HF but served after moving in.

#### **Health care services: emergency room, inpatient, and outpatient services**

We attempted to collect complete health care use and cost records including emergency room visits, inpatient days, outpatient clinic visits. For Anchorage participants we received data from all three of the major acute care hospitals in the municipality and for Fairbanks participants we received data from the single non-military acute care hospital serving the area. We also received data on outpatient visits from the largest

federally qualified health center in Alaska which is located in Anchorage and has a special program aimed at providing health care for the homeless and from the Health Center in Fairbanks operated by the same organization that operates the Fairbanks HF facility.

In the 12 months before tenants moved into Housing First facilities, a total of \$1,427,022 in health care costs were incurred for the 54 HF tenants participating in the cost analysis (\$628,343 for 23 tenants in Anchorage and \$789,678 for 31 tenants in Fairbanks). On average, tenants incurred \$26,426 in health care costs in the year before moving into HF (median \$9925). These per tenant health care costs were higher in Anchorage (mean \$27,319, median \$10,439) than in Fairbanks (mean \$25,763, median \$9622).

Per tenant mean adjusted total annual health care costs fell 44% to \$14,321.71 in Fairbanks in the year after moving into Housing First, with the median rising slightly by 5% to \$10,083. Mean adjusted total annual health care costs for tenants in Fairbanks rose slightly the following year to \$15,608 but remained 39% below the year before moving into Housing First. The median adjusted total annual health care costs for tenants in Fairbanks fell to \$7587, which was 21% below the median for the year before moving into Housing First.

In Anchorage, on the other hand, per tenant mean adjusted total annual health care costs increased by 3.5% from the year before moving in to HF to \$28,274 in the first year after moving in with the median increasing 52% to \$15,894. Per tenant mean adjusted total annual health care costs increased again to \$56,726 in the second year after moving into



HF, which was slightly more than double the mean adjusted total annual health care costs for the year before tenants moved in to HF. The median adjusted total annual cost also increased to \$19,563, slightly less than double the median for the year before the tenants moved in to HF.

### **Health care services: detox**

During the year before moving into Housing First, the number of detox days per tenant was higher in Fairbanks than in Anchorage (Fairbanks Year 1: mean 6.3, median 1.0; Anchorage Year 1: mean 3.0, median 0;  $P = 0.059$ ). The annual number of detox days dropped significantly for tenants at both HF facilities from the year before moving into HF to the first year after (Fairbanks Year 2: mean 1.1, median 0; Anchorage Year 2: mean 1.1, median 0;  $P = < 0.001$  for the first year after moving in compared to the year before) and remained low (Fairbanks Year 3: mean 1.0, median 0; Anchorage Year 3: 0.3, median 0;  $P = 0.226$  for the first year after moving in compared to the second year after moving in) during the second year after moving into HF.

## **Discussion**

This study evaluated the costs and quality of life among tenants in Housing First facilities in Anchorage and Fairbanks, Alaska. The two facilities are similar in that they are both site-based, located in converted hotels with approximately 45 studio apartments, and patterned after the New San Marco Housing First apartments in Duluth, Minnesota. However, they differ in that the Karluk Manor facility in Anchorage is operated by a statewide non-profit organization that partnered with a local non-profit mental health service provide for case management while the South Cushman facility in Fairbanks is tribally operated and includes formal on-site case management. Given the limited sample size, the evaluation combined tenants from the two facilities for most analyses.

A concurrent mixed methods study design consisting of both survey and interview data provided insights into life experiences before entering the Housing First facilities, and how daily life changed as a result of moving into those facilities. Tenants responded to questions about physical and mental health, alcohol use, community and social connections, and specific aspects of Housing First.

Our findings shed insights into both attributes of, and outcomes from, the Housing First model in Alaska. The study is important in that it shows that the Housing First model can be effective at addressing homelessness even among the most vulnerable of the chronically homeless, many of whom have been historically difficult to house and may have spent years or decades living on the street in a state where the weather and the

environment make that especially challenging. We found that in addition to the provision of a private apartment, tenants described how the Housing First model also provided them with enhanced security, access to health care services, supportive staff, and social connections.

We found that significant improvements in medication adherence and an increase in outpatient medical service use are likely due to staff assistance with medication storage and scheduled intake, as well as transportation to and from appointments. Tenants self-administer all medications, but staff are able to remind a tenant if they forget, and the medication dose is logged. As the highest reported chronic conditions were frequently medicated ailments like pain, PTSD, and high blood pressure, an increase in medication adherence is likely to contribute to positive health outcomes. We believe that continued housing stability allowed for awareness beyond basic needs, increased access to preventive health services and contributed to the increases in medication adherence, sober activity, improved mental health and an emphasis on finding employment. At both the study locations, encouragement and logistic support from staff were identified as instrumental to tenant success in these domains. These findings, which are consistent with previous studies (Kertesz et al., 2015), should be considered when training staff for future HF facilities.

While alcohol consumption at the two HF facilities at follow-up was still high by current measures, including the validated Alcohol Dependence Scale (Doyle & Donovan, 2009; Skinner & Horn, 1984) and Quantity-Frequency methods (Greenfield, 2000), tenants reported drinking less at follow-up than at baseline. Tenants who were consuming alcohol at the same frequency as at baseline, were often consuming less quantity, and vice versa. These findings are consistent with previous studies (Collins, Malone, et al., 2012). Some tenants cited the decrease in alcohol use as directly attributable to feelings of safety associated with having permanent housing. Tenants also cited warnings from doctors and concern for their own health as reasons for reducing alcohol consumption.

Cost and service use data collected in Anchorage and Fairbanks reveal a decrease in the use of emergency and legal services among Housing First tenants. However, despite a decline in expenses related to the use of safety and legal services, we do not see a total elimination of the need for these services. Similar savings have been found in the project-based HF facility in Seattle, WA and at multiple project-based and scattered site HF facilities in other parts of the US and Canada (Clifasefi et al., 2013; Larimer et al., 2009; Ly & Latimer, 2015).

Changes in health care utilization and costs were more variable and harder to track than the changes in emergency services. We had the most complete

data for emergency room services. Emergency room use decreased at both facilities, but the decrease was seen more quickly in Fairbanks than in Anchorage. Total costs for inpatient, outpatient, and ER visits decreased the first year after moving into Housing First but then increased during the second year. This pattern was driven mostly by costs for inpatient services.

Despite the high levels of self-reported substance use treatment among HF tenants during interviews, the per-tenant number of detox days per year was relatively low. While it is possible that we are missing data from detox facilities that were not included in the study, it seems more likely that while HF tenants may have sought detox treatment many years ago, at the time of the study many were not seeking detox services or were not able to get into detox when they wanted the services. The use of detox services, while low to begin with, decreased over the 3 years of the study.

The analysis of changes in costs related to health care as individuals move into permanent supported housing must take into consideration the available services and the payment structures associated with those services. The Housing First tenants in this study have spent many years living on the street. In some cases, they have experienced childhood and/or adult trauma. These tenants are likely to be in need of physical and mental/behavioral health care services, but whether they seek out and receive those services depends to a great extent on what other supports they have. In the year before moving into permanent housing tenants were likely to receive crisis services but had a harder time receiving ongoing, planned care.

In general, health care costs increase as people move into their later years. People who live on the street and who have chronic substance abuse problems are less resilient as they age and may be starting to incur these higher costs at a younger chronological age than their housed counterparts. Interview and survey data suggest that despite living in Housing First, there is a continued need for medical care to address chronic and acute conditions.

Average health care costs in a given year in this study tend to be driven by the high costs of services for a very small number of individuals, although the specific individuals are incurring extremely high costs vary from year to year. A more detailed look at the diagnoses and services provided, and the detailed medical history that preceded the current need for expensive services, may be needed to understand the true drivers of high health care costs for Housing First tenants. It may also be informative to consider how if and how the costs associated with care for Housing First tenants is distributed between municipal and state-level programs and services.

## Limitations

Findings from the QoL study are based on self-report and may be subject to recall bias. We aimed to minimize these effects by using a life history approach to the study interviews and developing an illustrated Drinking Assessment tool based on a standard fifth to help with accurate assessment of drinking in typical homeless social situations. We also developed a protocol reviewed and approved by the UAA IRB to assess intoxication before obtaining consent and completing each survey or interview. Intoxicated individuals were not asked for consent and were not asked to complete any study activities; however, they were eligible to participate later, if they were not intoxicated.

Findings from the Cost Analysis may be affected by missing data. Service providers extracted data based on identifiers provided by the HF tenants. Services obtained anonymously or under other names would not have been included. Also, while we tried to include service providers most likely to serve HF tenants, we were not able to include all possible providers in the study. Differences in health care costs for tenants at the two facilities may be affected by differences in missing health care cost data.

The cost data collected for this study focused on the incremental cost of providing specific services to specific individuals. To better understand the financial implications of changes in service needs for chronic homeless individuals with severe substance issues when they move into permanent supportive housing, actual costs including infrastructure costs and decision criteria for making changes in staffing and equipment levels must also be considered, which was beyond the scope of this study.

## Conclusions

Tenants in Housing First facilities in Anchorage and Fairbanks have significantly reduced alcohol consumption, moderately improved physical and mental health, and increased social engagement and connectedness among and between their residents and staff. Housing First tenants still face many challenges, but they are often better able to meet those challenges when they have a room with a door and supportive staff available.

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## Notes on contributors

**Dr. David L. Driscoll** was the final study Principal Investigator and Director of the Institute for Circumpolar Health Studies (ICHS).

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**Ms. Chelsea Chapman** was a Project Manager and Research Associate for the ICHS.

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**Ms. Sarah Shimer** contributed to quantitative data collection and analysis and was a Research Associate for the ICHS.

**Rebecca Barker** contributed to qualitative data collection and analysis and was a Research Associate for the ICHS.

**Ms. Nancy Burke** contributed to overall study implementation and analysis and was Senior Program Officer for the Alaska Mental Health Trust Authority (Trust).

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