

HEALTHCARE UTILIZATION ANALYSIS FOR HOUSING FIRST PROGRAM IN
ANCHORAGE ALASKA

Project Practicum Final Report

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I. Abstract

Homelessness, especially for the chronically homeless individual with substance abuse issues, often results in high use of emergency services, depression, loss of hope, increased victimization, poor medical care of chronic conditions, and intense suffering for the individual affected. Proponents of the Housing First model believe that housing is a human right, a need, and should be made available to all for basic human dignity. The primary purpose of this study was to answer the question of whether a Housing First model example in Alaska has impacted healthcare utilization for this specific population. Data on hospital visit numbers and hospital costs were collected from both a tenant and a control sample, for the 2011-2013 period, from three area hospitals. Initial findings indicated there was higher outpatient healthcare service use for the tenant sample after obtaining supportive housing. The control sample also showed statistical significance for an increase in emergency services costs, which was not evident for the tenant sample. Future Housing First programs in Alaska may provide improved healthcare for individual tenants by increasing utilization of outpatient services.

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I. Introduction

Homelessness is a problem in the community of Anchorage, Alaska. An attempt to count all the homeless individuals in Anchorage in one night in 2009 resulted in a count of 4583 individuals (Alaska Justice Forum, 2009). The actual number of homeless individuals within the Anchorage area can be difficult to count due to the transient nature of the population and the large amount of green space in Anchorage. Many homeless individuals also suffer from alcoholism, as well as other comorbidities, further increasing their vulnerability (Alaska Justice Forum, 2009). In the 2009 Alaska count, 9% of the homeless individuals were classified as chronically homeless individuals, and over 13% were classified with substance abuse issues (Alaska Justice Forum, 2009). Nationwide, chronically homeless individuals have been estimated to be as high as 123,833 of the 671,888 who are homeless everyday (Kertesz et al., 2009). The percentage of homeless individuals with alcohol and substance abuse issues can vary from city to city, with one source citing “a review of 29 studies conducted worldwide estimated an alcohol dependence prevalence of 37.9% among homeless population” (Collins et al., 2012).

One proposed solution to chronic homelessness is the Housing First model, which emphasizes housing as a basic human right and does not require sobriety prior to obtaining supportive housing. Housing First projects are relatively new to Alaska. Karluk Manor, a 46-bed facility opened in 2011 and was the first facility in Alaska to follow the Housing First supportive housing model (Karluk Manor Overview, 2013). Other communities in Alaska have opened or are in planning phases for Housing First facilities, including Fairbanks and Juneau. This practicum project evaluated the healthcare utilization impact of Karluk Manor on chronically homeless individuals in Anchorage, Alaska.

II. Background

The chronically homeless pose a financial cost to communities by disproportionately utilizing community resources including: emergency medical services, ambulance services, police time, social services, and use of the criminal justice system (RurAL CAP, 2013). RurAL CAP estimates the community cost in Anchorage for one chronic homeless individual at more than \$60,000 annually (RurAL CAP, 2013). In addition to the financial burden of homelessness in the community, homeless individuals suffer from many health problems including poor management of chronic conditions, exposure to adverse weather conditions, poor nutrition, increased infections, and increased trauma (RurAL CAP, 2013). Providing housing for these individuals in a Housing First program may actually result in lower community costs. According to Pathways Housing First in New York City, municipal costs per capita per night were \$57 for Pathways Housing First compared with \$73 for shelter housing, \$164 for a night in jail, and \$1185 for a day of inpatient psychiatric hospitalization (Pathways Housing First, 2014). In 2010, in response to heavy news coverage following 21 deaths of homeless individuals in Anchorage, Mayor Dan Sullivan established the Mayor's Homeless Leadership Team to make recommendations for permanent solutions for chronically homeless individuals in Anchorage (Karluk Manor Overview, 2013). One recommendation from this team was to develop supportive housing programs, which along with funding from the Alaska Housing Finance Corporation, led to the eventual development of Karluk Manor (Karluk Manor Overview, 2013).

Several studies have evaluated costs associated with Housing First programs and potential increased or decreased costs to the community. The New York, New York Housing First program has been in existence for over a decade, and reductions in public service costs have been averaged at \$12,146 per tenant per year in this program, which offsets some but not all of housing costs (Kertesz, et al., 2009). Studies have also shown a cost shift from emergency services to outpatient services

for tenants once they obtain stable housing (Desilva, et al., 2011). Since Karluk Manor is the pioneer Housing First program in Alaska, there have been no previous cost studies completed for this state for Housing First programs. Utilizing the emergency room for medical treatment instead of primary care sources leads to higher healthcare expense with poor long-term health outcomes for chronic conditions (Ku et al., 2013). A recent pilot study showed that stabilizing housing could lead to dramatically decreased use of emergency room services (Srebnik et al., 2013). There is need to determine if utilization of services will follow these patterns for Alaska.

Alaska has one of the highest per capita alcohol consumption rates in the nation across all ages (DHSS, 2014). According to the State of Alaska, alcohol abuse and dependence rates in Alaska are twice the national average at 14% of the population (DHSS, 2014). Modern theories of alcohol dependence and abuse show multiple inputs that lead to alcoholism. According to the National Aboriginal Health Organization in Ottawa, Ontario, Canada, the primary theories of substance abuse: disease theory, biological theory, and psychological theories are all part of the complex combination of factors that underlies drinking problems (Korhonen, 2004). This complex set of inputs includes disease process, mental health, genetic factors, social conditions, environment, culture, and personal psychology (Korhonen, 2004). Additionally, aboriginal cultures may be at risk for stress related to historical trauma within the culture, as well as ongoing economic, health, and educational disparities in rural areas, which can lead to increased substance abuse rates (Korhonen, 2004).

Most traditional housing options for chronically homeless individuals have required substance abuse treatment and abstinence as a requirement for housing (Tsemberis et al., 2004). This left many chronically homeless individuals with substance abuse issues without a means to achieve housing due to being unwilling and/or unable to achieve and maintain sobriety. Even if permanent housing is obtained, housing can be lost and individuals can easily return to a state of homelessness by an alcohol or drug relapse. The most common current service delivery model for supportive housing is the Continuum of Care model. This model

“begins with outreach, includes treatment and transitional housing, and ends with permanent supportive housing” (Tsemberis et al., 2004, p. 651). This program model requires commitment to substance abuse treatment and to sobriety. “Most programs are poorly equipped to treat people with dual diagnosis, let alone prepared to address their housing needs. Treatment requires time and commitment and is often not available if a program is under pressure to move clients along a continuum” (Tsemberis et al., 2004, p 651). This population encounters barriers to engagement in supportive services that also reduce the likelihood of successful completion (Collins et al., 2011).

Alternatively, Housing First is a model of supportive housing designed without requiring a commitment to sobriety as a condition of housing. The Housing First model is often attributed to Sam Tsemberis and the Pathways Housing First project in New York founded in 1992. This housing project was designed to assist chronically homeless individuals who had a history of substance abuse and mental illness (Pathways Housing First, 2014). The Housing First model identifies a population of vulnerable chronically homeless individuals, and offers stable secure permanent housing without any requirements to engage in treatment or sobriety (Tsemberis et al., 2004). Many of the current Housing First projects give priority to those individuals who are suffering from chronic substance abuse, mental illness, and chronic medical conditions (Kertesz et al., 2009). The Housing First model offers supportive services and intensive case management with a goal of community reintegration (Pathways Housing First, 2014). The Housing First program is one of harm reduction for substance abuse for a vulnerable population. The founder of the Pathways Housing First Project, Sam Tsemberis, summarizes the model as follows:

Some people think when you give housing away that you're actually enabling people as opposed to helping them get better. Our experience has been that the offer of housing first, and then treatment, actually has more effective results in reducing addiction and mental health symptoms, than trying to do it the other way. The other way works for some people, but it hasn't worked for the people who are chronically homeless (Pathways Housing First, 2014).

The Housing First model views housing as a required ‘first step’ to rehabilitation and community reintegration for the chronically homeless who have been previously unsuccessful in more traditional treatment programs.

Housing First supportive housing is a controversial topic in Anchorage and other communities. Those opposed to supportive housing sometimes view this type of housing as enabling, by allowing individuals to continue to make poor decisions without consequence (Pearson et al., 2007). Some opposed to this model feel that there are already enough resources available to support homeless in the community (Pearson et al., 2007). Others opposed to building supportive housing cite examples of other community needs and failures in reforming this population (Kertesz et al., 2009). Continued research of the Karluk Manor program will allow a better determination of whether the model serves the public health interests of Anchorage, Alaska and of chronic homeless individuals.

Figure 1 below, represents an individual’s path to possible treatment through the Housing First model which begins with housing, unlike the Continuum of Care model which requires treatment adherence and commitment as a means to obtain housing. Treatment and abstinence are not requirements in the Housing First Model.

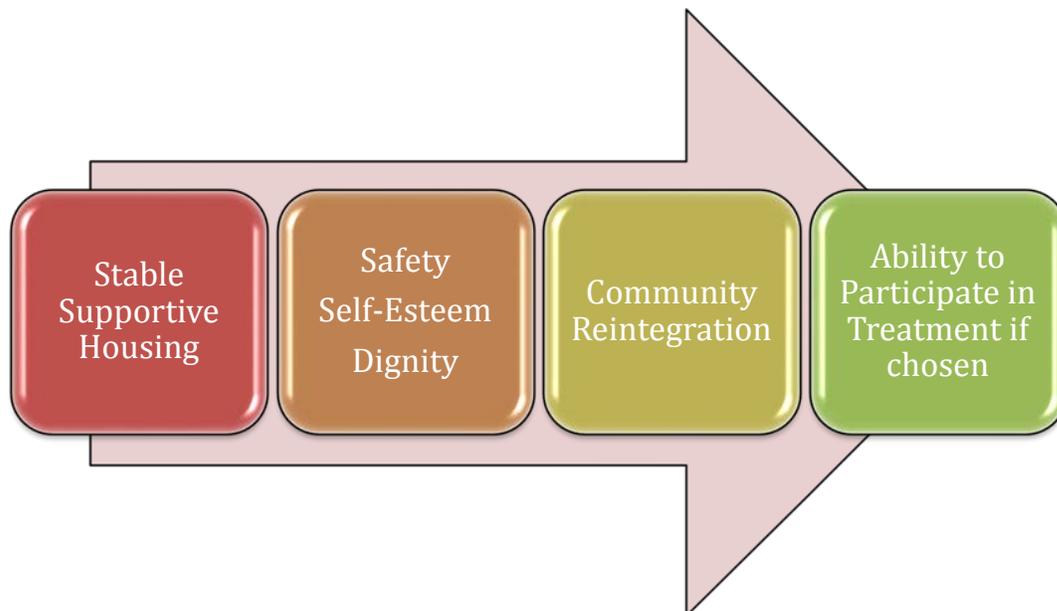


Figure 1- Theoretical Framework

In an interview with one of the founders of the Housing First movement, Sam Tsemberis shared data from the New York Pathways to Housing program, “Eighty-four percent of the people who had come directly off the street with significant mental health and substance abuse problems had been engaged into the program, received housing, and remained housed” (Evans, 2012). Tsemberis continues, “The people we work with are incredible survivors, creative, resourceful, caring, and very good at making ends meet with very little money.... This program provides an opportunity to demonstrate that fact” (Evans, 2012).

The National Alliance to End Homelessness, and later the US Interagency Council on the Homeless (USICH), took note of the research findings showing success of early Housing First examples in New York City providing stable housing over time for the chronically homeless population. In 2003, the USICH coordinated funding for a national replication of Housing First in eleven cities across the U.S. Results of that initiative were consistent in proving positive outcomes (Evans, 2012). In 2008, the Mental Health Commission of Canada invested in a Housing First experiment in five cities across Canada. Results there are showing similarly positive outcomes (Evans, 2012; Christensen, 2012). In a study regarding consumer’s response to housing first programs, a resident stated:

Because I mean that’s scary when your housing is tied to your ability to remain abstinent. I mean you live kind of in a constant fear...It’s not conducive to remaining sober with that kind of pressure, and it’s not conducive to remaining housed...it’s a huge relief when you realize your housing is not tied to your ability to remain abstinent (Watson, 2013, p. 170).

In Anchorage, Karluk Manor is a 46 unit supported housing facility, is staffed 24 hours/day and provides residents with meals, light housekeeping and some social services. Early studies of this program and other similar Housing First programs show that even though sobriety is not a requirement for housing, the program has been successful in decreasing alcohol use (Karluk Manor Overview,

2013). Residents of supported housing have a chance to improve their lives in more ways than simply eliminating alcohol. As one Housing First supervisor described:

I think the take home point is that our findings really show that chronically homeless people with alcohol problems are human beings who are very capable of making positive changes in their lives if they're given the same chance as the rest of us, and that getting that chance really starts with having a home (Eaton, 2012).

In a 2012 article, Eaton interviewed a resident of Karluk Manor who had been homeless for four years prior to obtaining housing. In the article, this resident is quoted as stating, "When I got here, I couldn't believe what I had and I was very grateful. One I was off the street. I was in from the cold. I'm able to take a bath or a shower and I'm able to lock the door. I'm not afraid to go to bed anymore" (Eaton, 2012). This quote highlights the very real problems associated with remaining homeless, as well as one example of improved quality of life after obtaining supportive housing.

The Housing First model of care is still a relatively new housing model and research remains limited. Further research specific to the Alaskan population is necessary to understand how this model will impact Alaskan stakeholders.

Research to date has largely been focused on urban areas where the first Housing First programs developed. However, in a 2013 study, researchers demonstrated that a Housing First model could be successfully implemented in a rural area of Vermont with similar outcomes to urban programs (Stefanic, A., et al., 2013).

Research in this field has leaned towards qualitative methods with researchers often attempting to better understand how the housing programs have directly impacted the lives of residents through resident and staff perceptions. Some researchers have included staff shadowing, coding staff/resident interactions and focus groups in addition to qualitative interviews (Collins et al., 2012). In studies conducting qualitative interviews, residents are often paid for their interviews (Collins et al., 2012). Some longitudinal studies have been conducted evaluating local government records to follow housing retention rates over time (Stefanic & Tsemberis, 2007). Other studies have evaluated some quantitative data related to

emergency admissions or other specific health indicators related to homelessness (Ku et al., 2010).

III. Project Goals and Objectives

The project goals and corresponding objectives are:

Goal 1: To evaluate the healthcare utilization impact of a “Housing First” program in Anchorage in terms of service use through hospital visit counts and cost.

Objective 1.1: Determine if there was a change in hospital visit count over the 2011-2013 time period for a tenant sample group, which represented data prior to and after obtaining housing within Karluk Manor.

Objective 1.2: Assess if there was a change in hospital visit count within the subcategories of inpatient, outpatient, or emergency services for the same time period.

Objective 1.3: Determine if there was a change in total hospital care cost over the 2011-2013 time period for a control sample group of those who remained homeless.

Objective 1.4: Assess if there was a change in hospital cost in the subcategories of inpatient, outpatient, or emergency services for the same time period.

Goal 2: To compare a control sample of chronically homeless individuals with a sample of “Housing First” tenants to determine differences in service use.

Objective 2.1: Compare demographic data between the tenant and control group to assess similarity or differences in groups.

Objective 2.2: Statistically compare hospital visit count and hospital data between the tenant and control samples for differences.

Objective 2.3: Consider ways in which the control sample may or may not reflect the tenant sample.

V. Methods

For this study, a quantitative retrospective study design was used. The population studied consisted of Karluk Manor tenants who provided consent for participation in the ICHS Housing First cost evaluation, and a control sample obtained from individuals on the Karluk Manor waitlist who also provided consent for participation. For this project, this researcher analyzed data obtained from three area hospitals for visit count and cost data.

A. Protecting Human Subjects

University of Alaska Anchorage (UAA) Institutional Review Board (IRB) approval for this portion of the larger Institute for Circumpolar Health Studies (ICHS) study was granted. This researcher was added to the ICHS IRB for this researcher's project component of the evaluation. Karluk Manor tenants are recognized as a vulnerable population. Participation in all research was voluntary. Informed consent was obtained from each participant prior to any research. Participants also had the opportunity to ask the researcher questions prior to beginning research and throughout the process. Personal identifiers remained confidential. This study demonstrated respect for the individual by obtaining consent and by valuing the input and quality of life of the individual. This study is valuable in beneficence in strengthening the knowledge of the success or failure of Housing First as an alternative to homelessness in Anchorage and the future of housing projects within the State of Alaska. Housing and homelessness in Anchorage, Alaska represent social justice concerns. This study sought to evaluate the healthcare utilization impact of one suggested alternative for housing justice.

B. Sampling

Due to the small size of Karluk Manor, the total population from which a sample could be achieved was also relatively small. Tenants were eligible for inclusion in the study if they moved in between December 2011 and July 2012 so

that a minimum of 18-months of follow up data could be obtained. Attempts were made to include all eligible tenants who wished to participate in the study. The control sample was obtained from the Karluk Manor waitlist.

C. Data Collection

Residents were contacted in person by the ICHS staff. Each study participant was asked permission to request their data from a list of service providers in Anchorage who provide services to area residents, including the homeless and recently housed. Study participants were asked to provide identifying information including their full names, aliases, dates of birth, Alaska driver's license number or Alaska identification number, and social security number in accordance with the protocol that was reviewed and approved by the UAA IRB. Data was gathered physically and electronically at the ICHS offices, and analyzed at ICHS offices location. Identifying information was recorded on the Authorization for Release of Information. This information was then entered into a secured, password-protected database shortly after being received from participants. Original data have been and are being stored and protected, and will eventually be destroyed in accordance with ICHS IRB submission. For this project, this researcher chose to focus on hospital data. Agencies providing healthcare data for this project report include: Alaska Native Medical Center, Alaska Regional Hospital, and Providence Alaska Medical Center.

D. Data Analysis

Data collected from healthcare facilities according to the Authorization of Release of Information included encounter type (outpatient, inpatient, and emergency services), date of service, and the charge for each service. Data was evaluated for hospital visit count, cost per service, and service subcategory for the time period of 1/1/2011- 12/31/2013 (or as provided for this time period by agency). Healthcare visit encounter data was compared on average per-month and

annual aggregate levels. Cost was estimated using cost data provided by healthcare facilities as requested on the Release of Information forms.

Data entry was performed using double entry verification with two different people entering the data for accuracy on Microsoft Excel. Any discrepancies were then re-evaluated by researchers and corrected for accuracy. Depending on the entry month for each resident, there were at least 11 months of data available prior to move in and 18 months of follow up. When less than 12 months of data was available for the year prior to move in or final year of follow-up, the mean visit data and hospital cost for each month within that calendar year was then multiplied by 12 to produce an average annual cost per tenant or control. 2011 represented the year prior to move in for tenants, and 2012/2013 represented data after obtaining housing at Karluk Manor.

Mean visit numbers and costs for each year were calculated for both the tenant and control sample groups for 2011, 2012 and 2013. Cost and visit count subgroups were created for inpatient, outpatient, and emergency department costs for each year for both tenant and control groups. A Pearson's Chi-Square test was performed to evaluate differences between ages and gender (male or female) of the control and sample groups. The ages were divided into the following categories for comparison: under 35, 36-45, 46-55, and over 55. The three years of the mean hospital visit data and cost data was compared for the sample group using the Friedman's Test, a non-parametrical statistical test that is analogous to a parametric repeated measures Analysis of Variance (ANOVA). This test was performed to evaluate differences between the years within the sample group. When a significant difference (P Value < 0.05) was found on the Friedman's Test, pair comparisons were completed using the Wilcoxon Signed Ranks Test. The Friedman's Test and Wilcoxon Signed Ranks tests were also completed for the control group across the three years worth of hospital mean cost data, and for mean hospital visit count data for both the control and sample groups. Finally, the means between the control and sample group were compared for each year for both the cost and visit data, using the Mann-Whitney Test, a non-parametric test.

VI. Results

Of the current 46 Karluk Manor Residents, 31 had move-in dates from December 2011-July 2012. Of these 31, 3 declined to participate in the study and 5 were unavailable. This left 23 residents included in the tenant sample. The control sample consisted of 12 participants. Using SPSS version 19 software, a Pearson's Chi-Square test was done (sig. P value = 0.861 for gender and 0.946 for age [2-sided] which showed no statistically significant difference between the control and tenant samples in age and gender. Table 1 shows the detailed demographic data.

Table 1. Demographic Data

Gender	Tenant Sample	Control Sample
Male	16 (70%)	8 (67%)
Female	7 (30%)	4 (33%)
Age		
18-29	0	1
30-39	5	1
40-49	7	5
50-59	10	3
60+	1	1
Mean Age	49	48
Percent over age 50	48%	36%

Tables 2 and 3 show the mean annual inpatient, outpatient, and emergency hospital visit counts per tenant or control as well as standard deviations for each year rounded to the nearest hundredth, and the combined average hospital visit count for each year. For the tenant sample group, total mean hospital visits increased from 10.09 in 2011 to 26 in 2013. The control sample also showed an increase from total mean hospital visits of 11.59 in 2011 compared to 12.71 in 2013.

Table 2. Mean Tenant Healthcare Visit Count Per Year

	2011	St Dev	2012	St Dev	2013	St Dev
Alaska Native Medical Center	9.48	43.50	12.43	57.05	25	114.06
Alaska Regional Hospital	0.35	1.79	0.17	0.92	0.13	0.74
Providence Alaska Medical Center	0.26	1.35	0.61	2.88	0.87	4.66
Combined Total	10.09	46.19	13.22	60.48	26	118.39

Table 3. Mean Control Healthcare Visit Count Per Year

	2011	St Dev	2012	St Dev	2013	St Dev
Alaska Native Medical Center	9.67	12.22	10.08	10.35	12.08	10.96
Alaska Regional Hospital	0.17	0.39	0.08	0.29	0.17	0.58
Providence Alaska Medical Center	1.75	4.63	0.08	0.29	0.46	2.54
Combined Total	11.59	12.92	10.25	10.46	12.71	10.63

Tables 4 and 5 show the mean annual inpatient, outpatient, and emergency hospital costs per tenant or control as well as standard deviations for each year rounded to the nearest dollar, and the combined average hospital cost. For the tenant sample (Table 4) group cost increased for 2 of 3 hospitals from 2011 to 2013. The combined total individual mean tenant hospital cost increased in from 2011 to 2013

by \$33,695, or 124%. The control sample (Table 5) also experienced an increase in hospital costs from 2011 to 2013. The combined total individual control mean cost increased from 2011 to 2013 by \$44,525, or 179%. The high standard deviation is a result of small sample size and variability within each group. Some tenants and/or controls had no hospital visits or costs, while others had significant service use.

Table 4. Mean Tenant Healthcare Cost Per Year

	2011	St Dev	2012	St Dev	2013	St Dev
Alaska Native Medical Center	\$24,618	\$37,949	\$26,822	\$30,723	\$52,698	\$87,230
Alaska Regional Hospital	\$1820	\$4264	\$97	\$267	\$7471	\$30,419
Providence Alaska Medical Center	\$780	\$2,567	\$2,441	\$4,296	\$743	\$2,302
Combined Total	\$27,217	\$38,7345	\$29,360	\$30,308	\$60,912	\$89,638

Table 5. Mean Control Healthcare Cost Per Year

	2011	St Dev	2012	St Dev	2013	St Dev
Alaska Native Medical Center	\$18,090	\$27,962	\$38,791	\$55,689	\$53,917	\$67,678
Alaska Regional Hospital	\$58	\$201	\$292	\$1013	\$470	\$1627
Providence Alaska Medical Center	\$6,771	\$20,471	\$38	\$130	\$5,922	\$14,605
Combined Total	\$24,919	\$33,348	\$39,121	\$56,511	\$60,309	\$69,444

Figure 2 is a box chart of combined tenant and control costs for emergency services, outpatient, and inpatient costs from 2011-2013. The top lines of each box

in figure 2 represent the maximum cost for subcategory for each year. As illustrated in figure 2, there is variability in individual tenant costs, with some tenants having no cost, and some having high cost. For all years, the median cost was significantly less than the maximum cost. All years had a minimum data cost of zero and for 7 of the 9 data sets, the quadrant 1 data also was zero. For inpatient costs in 2012, most control and tenants had no costs. This illustration is representative of the range in the cost data, which does not follow a normal distribution curve.

Figure 2. Illustration of Cost Data Range: Tenant Sample Costs in Thousands of Dollars for years 2011-2013 for Emergency Department, Outpatient, and Inpatient subcategories.

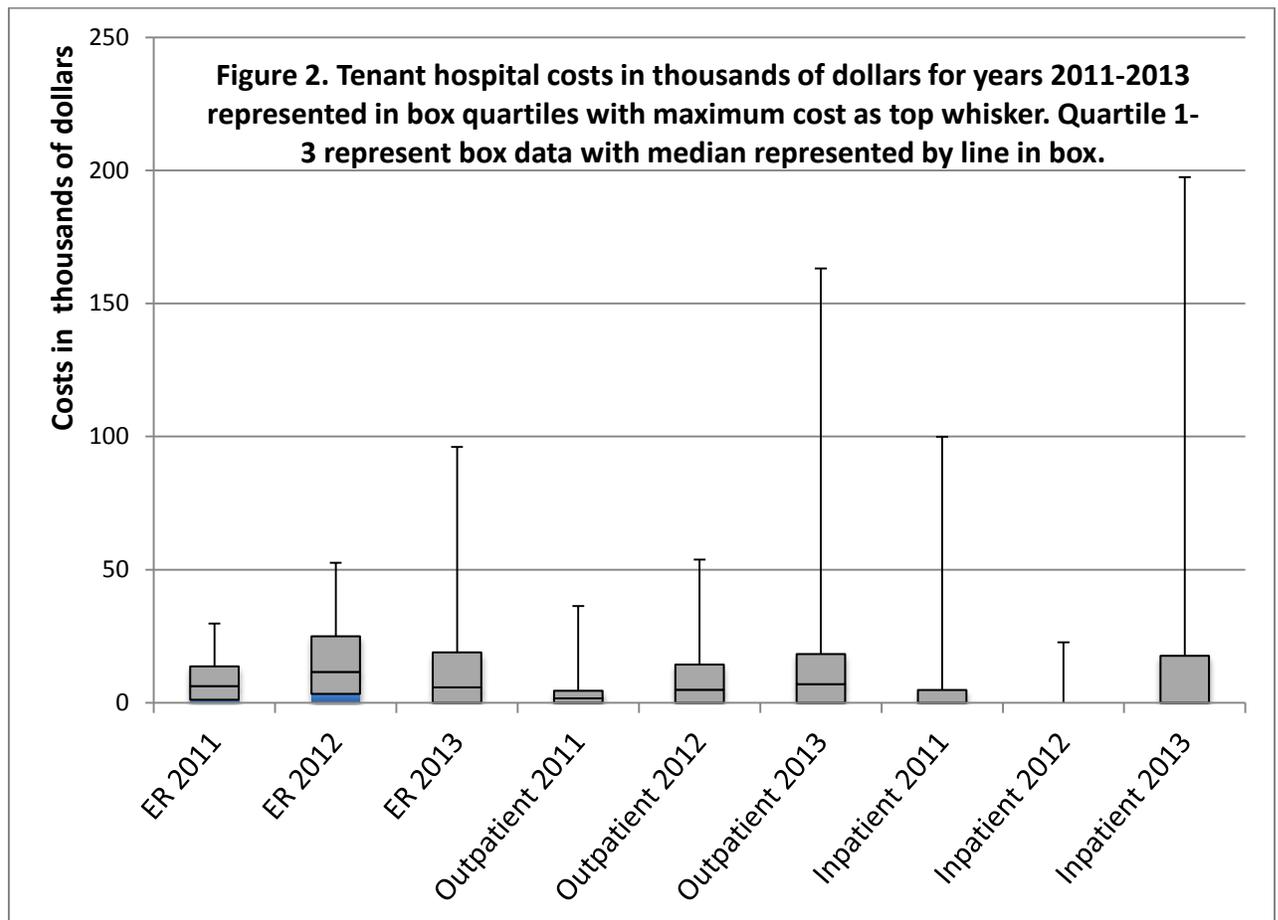


Table 6 describes the mean tenant cost divided into the following subcategories: outpatient, inpatient, emergency department for years 2011-2013, as well the mean number of patient visits to each area. Outpatient visits for tenants increased from a mean of 2.9 to 7.8 visits ($p= 0.002$). Costs were higher for all three categories from 2011 to 2013. Table 7 shows the mean annual control sample cost and visit number for outpatient, inpatient, and emergency services. The control costs also were higher in all three categories from 2011 to 2013.

Table 6. Mean Annual Tenant Healthcare Service Use Summary (cost rounded to nearest dollar and visit number rounded to nearest 10th)

	2011 cost	2011 visit#	2012 cost	2012 visit #	2013 cost	2013 visit #
Outpatient	\$4,880	2.9	\$10,449	5.4	\$16,649	7.8
<i>Wilcoxon Signed Ranks Test</i>		$p=0.046^{**}$ (2011&2012)		$p=0.036^{**}$ (2012&2013)	$p=0.025^*$ (2011 & 2013)	$p=0.002^{**}$ (2011&2013)
Inpatient	\$13,391	2.8	\$3,044	0.5	\$31,592	3.0
Emergency Department	\$8,947	4.4	\$15,867	5.2	\$12,670	3.3

*significant difference in cost data means between years 2011 & 2013 $p < 0.05$.

**significant difference in visit means between each of the following: 2011&2012, 2012&2013, and 2011&2013

TABLE 7. Mean Annual Control Healthcare Service Use Summary (cost rounded to nearest dollar and visit number rounded to nearest 10th)

	2011 cost	2011 visit#	2012 cost	2012 visit #	2013 cost	2013 visit #
Outpatient	\$3,255	2.6	\$2,035	1.9	\$7,109	3.1
Inpatient	\$11,472	2.4	\$26,349	4.2	\$29,994	3.8
Emergency Department	\$10,192	6.5	\$10,736	4.2	\$23,206	6.3
<i>Wilcoxon Signed Ranks Test</i>			p=0.010**		p=0.013*	

*significant difference between years 2011 & 2013 p< 0.05.

**significant difference between years 2012 & 2013 p< 0.05.

The Mann-Whitney pair comparisons for each year for both hospital costs and visits between the tenant and control data revealed no significant difference between the two groups for any year or subgroup.

Tenant outpatient mean visits numbers showed a significant difference P Value = 0.019 when compared using Friedman’s Test for 2011, 2012, and 2013. These mean visits numbers for 2011, 2012, and 2013 were compared using the Wilcoxon Signed Ranks Test and a significant difference P Value = 0.002 was found between 2011 outpatient visits and 2013 outpatient visits, a P Value = 0.046 between 2011 and 2012, and a P Value = 0.036 between 2012 and 2013. During this time there was no significant change in outpatient visits or costs for the control group.

When control emergency department mean costs were compared for 2011,2012, and 2013 using Friedman’s test, there showed a significant difference (P value = 0.030). Using the Wilcoxon Signed Ranks Test, a statistical difference was noted between the control emergency department mean costs for 2011 and 2013, as well as for 2012 and 2013. This data shows that the mean control cost for emergency department services did increase significantly for the control group and not significantly for the tenant group. Emergency department mean cost for the

tenant group increased \$3723, or 42% from 2011 to 2013. Emergency department mean costs for the control group increased \$13,014, or 128%.

When tenant outpatient mean costs were compared for 2011, 2012, 2013 using Friedman's test, there showed a significant difference P Value = 0.023. Tenant outpatient mean costs showed a significant difference P Value= 0.025 using the Wilcoxon Signed Ranks Test between 2011 and 2013. Again, during this same time period, there was no significant change in outpatient visits or costs for the control group.

VII. Discussion

Chronic homelessness has been associated with higher risk of chronic health conditions (Desilva, M. et al., 2011). Because Karluk Manor targeted vulnerable chronically homeless individuals, it is likely that this would be a population with high medical needs. It is widely recognized in the medical community that use of outpatient services is a more efficient use of healthcare resources and results in improved health outcomes for chronic conditions (Bodenheimer, T., et al., 2002). Healthcare savings in outpatient care often represent a neglect in needed self-care for individuals such as when a patient suffering from diabetes does not fill medications, log blood sugars, or see a primary care physician for annual physical and lab work. Results from this cost evaluation show that after obtaining stable housing, those in the tenant sample were more likely than the control sample to seek outpatient care. This was seen in both an increase in outpatient visits for each of the years for the tenant group as well as increased spending in outpatient services, which was not matched in the control group. In addition to increased outpatient care, the tenant group did not have a statistically significant increase in emergency services spending, which did occur in the control group. These findings are similar to a study conducted in Minneapolis, Minnesota in 2011, which also saw

an increase in outpatient services and a decrease in emergency services two years after obtaining housing (DeSilva, et al., 2011).

The Housing First model suggests that obtaining supportive housing is a key step to achieving safety, dignity, and community integration (see figure 1). These findings suggest that by decreasing emergency care utilization and increasing use of outpatient services, the tenant sample has taken a step towards community reintegration in healthcare service use. This change in service use pattern could suggest Housing First Model success for Karluk Manor.

One of the hospitals in this study, Alaska Native Medical Center, is an Alaskan Native managed healthcare provider that receives funding from Indian Health Services in addition to other sources. In 2013, during this study, the federal government enacted sequestration. According to the United States Senate Committee on Indian Affairs, Yvette Roubideaux, Acting Director of the Indian Health Service said:

The impact of sequestration in FY 2013 was significant for Indian Health Service (IHS); overall, the \$220 million reduction in IHS' budget authority for FY 2013 was estimated to result in a reduction of 3,000 inpatient admissions and 804,000 outpatient visits for American Indians and Alaska Natives. In FY 2013, IHS made significant reductions in administrative costs, travel, and delayed hires, purchasing and planned renovations to focus on preserving the IHS mission(United States Senate Committee on Indian Affairs, 2013).

During this time of budget shortfalls and decreased federal funding, third party billing practices and billing charges may have changed within the Alaska Native Medical Center.

During the period, healthcare costs were higher in 2013 for both the tenant and sample control groups than in 2011. Some of this increase was likely due to inflation. Nationwide, healthcare costs have increased at a rate greater than the GDP and are likely due to an increased cost per case rather than increasing disease prevalence (Roehrig, C., & Rousseau, D., 2011). From 1980-2003 all consumer prices increased 132%, but healthcare prices increased 320% (Moon, M., 2005).

During the same time period, there was a 105% growth for service fees with a 339% growth for medical service fees (Moon, M., 2005). According to the United States Department of Labor Bureau of Labor Statistics, inflation for medical care in 2011 was 3.0%, 3.7% in 2012, and 2.5% in 2013. Although these inflation rates may accurately reflect national medical care data, inflation rates within Alaska may be higher than national averages. A 2011 cost comparison study found Alaskan physician services to be 160% of comparison states and hospital costs to be 138% of comparison states (Jhu, E., & Pickering, J., 2011). According to an article in the July 2014 *Alaska Economic Trends* published by the Alaska Department of Labor and Workforce Development, healthcare costs in Alaska rose by 5.3% in 2011, 4.3% in 2012 and 3.2% in 2013 (Fried, 2014). Several Housing First healthcare cost studies have used Medical Expenditure Panel Survey data to estimate hospital costs with examples such as \$688 for emergency department visits and \$3320 for inpatient hospitalization including physician fees (Kertesz S., & Weiner, S., 2009). These costs may be an accurate reflection of nationwide costs, but do not reflect the cost for services in Anchorage, Alaska, and while healthcare expenditures among tenants may appear lower in other states, it is also a reflection of the healthcare market in those states. It is likely that some of the increased cost of healthcare service use for both the tenant and control sample groups is a reflection of the growth of healthcare costs nationwide and also in Anchorage.

Despite the influence of sequestration and inflation, the findings in this study verify the increase of hospital outpatient service use among the tenant sample and an increase in hospital emergency service use among the control sample that did not occur in the tenant sample. These findings may illustrate improved health and community reintegration for the tenant sample.

VIII. Strengths and Limitations

These findings are important because of the data provided on an underserved population, which has not had a great deal of historical research

attention. This project, as part of the larger ICHS evaluation, is the first Housing First evaluation conducted in Alaska. Because of the geographical isolation of Alaska from the lower 48 states, the cost analysis of programs elsewhere have limited significance in Alaska. Alaskan data is important when making decisions for future Alaskan development. Previous researchers have acknowledged a lack of data for all states and rural areas as a limitation of current knowledge (Kertesz, et al, 2009). This study has added to public health knowledge by providing information in accordance with the 10 Essential Public Health Services through evaluating healthcare utilization within the Karluk Manor population, and through informing and educating about the Housing First project (CDC, 2013).

A limitation for this study is the small sample size of both the tenant sample and control sample group. This sample size is limited by the small population of the Karluk Manor (46 beds) and the time requirements for inclusion in the study. There is increased reliability risk reflected in a smaller sample size. Despite the restricted sample size, this study provides valuable documentation of healthcare utilization for the Housing First community in Alaska.

In addition to the small sample size, the control sample may not accurately represent the vulnerability of the tenants. Those most vulnerable controls may not have had survival times lasting the minimum time requirements to be included in the study. Other control sample individuals may have not been selected initially for housing due to having decreased vulnerability when compared to tenants who were selected. While the control sample may match the tenant group in demographic data, they may not match in vulnerability and healthcare needs.

Another limitation for this study was not knowing the exact impact of sequestration on healthcare billing within the Indian Health System. In addition not knowing the exact Anchorage, Alaska specific hospital medical care inflation rates.

Project success is also dependent on sharing data with stakeholders. The information will be shared by UAA ICHS to the appropriate stakeholders. This researcher's results have been shared with the UAA Master's of Public Health for Public Health Practice (MPH) faculty, stakeholders, and for purposes of the MPH graduation requirement.

IX. Public Health Implications

Findings from this practicum project should support further Housing First development in Alaska. Communities trying to discern cost components of opening Housing First developments should be reassured that healthcare utilization costs will not significantly increase, and that future tenants will be more likely to use outpatient healthcare services.

Public health professionals working with the chronically homeless population should recognize housing as a basic need and human right by supporting Housing First models. This research suggests that obtaining housing should be considered a priority step in improving health outcomes for the chronically homeless population. This study showed an increase in outpatient services utilization after obtaining housing and therefore, those professionals working to improve access to and utilization of outpatient care should recognize the importance of obtaining housing as a means of meeting that goal.

This research also suggests that although some cost shifting from emergency to outpatient hospital services may occur, the need for emergency services for this population will not completely disappear. There are many reasons that individuals seek emergency care services and further research for this specific population regarding reasons for emergency services utilization could be helpful.

The Housing First Model is one Housing First relates to several of the 10 Essential Public Health Services as outlined by the National Public Health Performance Standards Program including linking people to the needed personal health services and assuring the provision of health care when otherwise unavailable as well as mobilizing community partnerships and action to identify and solve health problems (CDC, 2013). The Housing First program seeks to link vulnerable homeless with housing and case management supportive services.

With change there is often resistance, and Housing First program planners as well as administrators must also perform the Essential Public Health Service of informing and educating the public about the Housing First alternative (CDC, 2013). The ICHS program evaluation will also serve to educate the community about Karluk Manor and the effectiveness of the services provided. Public health professionals should be able to provide evidence-based information to the public about the Housing First model and how such a model will likely impact the population housed as well as other community stakeholders.

This researcher's component focused on the Essential Public Health Services of evaluation by evaluating the effect of permanent housing has on healthcare utilization and costs (CDC, 2013). Continued research in how Housing First programs impact healthcare utilization could provide even more insight into this area.

Stakeholders for Housing First programs in Alaska are numerous, and include chronically homeless individuals as well as the general homeless population who could be greatly affected by changes in housing services available. Social service agencies in Anchorage and Alaska including those who provide services to the homeless in the form of shelter, food, and other services will also be affected if chronically homeless individuals obtain permanent housing. Neighborhood community members can also be impacted by the development of a new housing project in their area. Taxpayers and citizens of Alaska are also stakeholders. Existing government agencies such as police, ambulance/EMS services, and community service patrol also routinely provide services to the chronically homeless population. Also, healthcare organizations are stakeholders in the population health of their clientele.

X. Conclusions and Recommendations

Housing First programs may reduce overall costs to the community for individuals who without stable housing would require repeated hospitalizations and

incarcerations (Kertesz, et al., 2009). However, many Housing First tenants, especially when purposefully selecting the most vulnerable of the population, will have ongoing healthcare needs due to chronic medical problems. The goal to medically manage this population is not to ignore these chronic medical problems but to maintain optimal health through primary care and outpatient services. By obtaining consistent primary care, many tenants can achieve better management of chronic diseases (Bodenheimer, T., et al., 2002). From this study, it does not appear that being a tenant in a Housing First program in Alaska can be correlated with increased costs for healthcare. In this study, there was an increased cost associated with emergency services care in the control sample that was not found in the tenant sample. There was also increased outpatient service use found in the tenant sample data. This suggests that Anchorage Housing First tenants may be using outpatient services once stable housing has been achieved. Increased use of outpatient services with a decrease in emergency service utilization may also be an indicator of community reintegration for the tenant sample based on the Housing First model.

Future Housing First programs in Alaska may not result in significant healthcare savings to the community, but may provide improved healthcare for individual tenants by increasing utilization of outpatient services. Outpatient services can lead to better control of chronic illnesses and may decrease emergency services use in the future. Further studies following this population over longer amounts of time and further evaluation of new Housing First projects as they develop in Alaska will further public health knowledge in this area. Future studies examining the reasons for continued hospital emergency services utilizations would also be helpful.

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