# Evaluating the Impact of In-Home Behavioral Health Services on Housing First Residents' Emergency Room and Inpatient Utilization

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*Abstract: Individuals experiencing chronic homelessness are highly marginalized and frequently access acute healthcare services. This program evaluation used secondary data collected from adults experiencing chronic homelessness (n=133) who participated in a Housing First program offering in-home behavioral health services within a large Midwestern city. Participant demographics (e.g., gender, race, age) and data on health factors (e.g., substance misuse and mental health symptoms, and ER visits and inpatient hospitalizations) were collected at program enrollment and at 6-month and 12-month follow-ups. High proportions of missing data led the evaluators to exclude 12-month follow-up and in-home behavioral health data from the analyses. Neither inpatient nights nor ER visits changed significantly between enrollment and 6-months. Males were disproportionately hospitalized throughout the study, suggesting a need for gender-targeted services. Higher rates of hospitalization among African Americans at enrollment subsided by follow-up. Future evaluation should examine if in-home behavioral health services reduced racial health disparities. Acute care use was low overall, likely because of the stabilizing impact of housing. Data limitations suggest a need for more robust study designs to identify causal factors and to enrich our understanding of the role of behavioral health intervention within the Housing First paradigm. Results underscore the importance of using empirically-supported assessment tools to evaluate consumers' individualized needs and responsively allocate supportive services.*

*Keywords: dual diagnosis; emergency room; homeless; hospitalization; Housing First; in-home; SBIRT*

The U.S. Department of Housing and Urban Development (HUD) revealed that 567,715 U.S. residents were homeless at a single point in time in January 2019 (Henry et al., 2020). The literature has traditionally distinguished between people experiencing homelessness chronically, episodically, or transitionally (McAllister et al., 2011). Under HUD's current definition, individuals considered chronically homeless must possess a disabling mental or physical health condition and experience either a continuous period of homelessness exceeding one year, or four or more discrete episodes of homelessness in the preceding three years, totaling 12 months or more (U.S. Department of Housing and Urban Development, 2015). This definition builds upon HUD's prior conceptualization of chronic homelessness by requiring that discrete episodes total 12 months or more (Byrne & Culhane, 2015; Henry et al., 2020). In 2010, investigators found that homeless persons

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accounted for only 0.25% of the U.S. population, yet represented 0.5% of the nation's ER users (Ku et al., 2010). Similarly, although individuals experiencing chronic homelessness constitute only a fraction of the homeless population, they account for a majority of the group's housing and healthcare resource consumption (Aubry et al., 2013; Henry et al., 2020; Larimer et al., 2009; Wright et al., 2016).

Physical health problems, substance misuse, and mental health conditions are more prevalent among people experiencing homelessness, particularly chronic homelessness (Jaworsky et al., 2016). Risk accumulation theory attributes this population's high incidence of psychiatric and physical morbidity to overexposure to adverse life events (Lippert & Lee, 2015; Oppenheimer et al., 2016). Barriers to preventative healthcare can exacerbate health disparities, driving frequent hospital use (Chwastiak et al., 2012; Khandor et al., 2011; White et al., 2016). Meta-regressions of persons experiencing homelessness across Western Europe and North America yield elevated random-effects pooled prevalence of 11.4% for major depressive disorder, 23.1% for a personality disorder, 12.7% for a psychotic disorder, 37.9% for alcohol dependence, and 24.4% for drug dependence (Fazel et al., 2008). People living as homeless with serious mental illnesses also make greater use of psychiatric hospitals and less use of outpatient mental health services than their housed peers (Folsom et al., 2005). Relative to a matched-comparison domiciled group, Wadhera et al. (2019) found that hospitalizations for persons experiencing homelessness were disproportionately due to mental illness (at rates of 38% vs. 13%) and substance misuse (at rates of 14% vs. 5%). The researchers also observed that psychiatric, but not physical illnesses, were associated with homelessness chronicity (Wadhera et al., 2019). However, improved access to ambulatory care alone, through mechanisms such as insurance coverage expansion, may not translate into wholesale acute care reductions among people contending with chronic homelessness (Hwang et al., 2013; Lin et al., 2015).

Housing First has emerged as a promising model of permanent supportive housing to address these complex health and social needs (Henwood, Hsu, et al., 2013; Rog et al., 2014). Through Housing First, consumers are not required to abstain from substances or to achieve psychiatric or medical stability to enroll in housing; instead, they are given access to a variety of supports as they work toward individualized goals and reside independently (Nelson, 2010). Housing First programs lower mortality rates (Henwood et al., 2015) and healthcare costs (Larimer et al., 2009). Housing First is also associated with increased perceptions of consumer choice and mastery—factors theorized to allay psychiatric symptom severity (Greenwood et al., 2005). Compared to usual care (outpatient mental health and substance misuse services, sobering services, and shelters), Housing First recipients spend less time homeless or psychiatrically hospitalized (Brown et al., 2016). Moreover, several landmark studies challenge the assumptions inherent to treatment-contingent (Continuum of Care) models, with treatment-non-contingent (Housing First) program participants demonstrating either comparable or reduced mental health and substance misuse severity relative to Continuum of Care participants (Groton, 2013), as measured by the Addiction Severity Index (McLellan et al., 1980), Colorado Symptom Index (Boothroyd & Chen, 2008), Alcohol Use Quantity Form (Sobell & Sobell, 1992), Short Inventory of Problems (Blanchard et al., 2003), DSM-IV Alcohol Dependence

Checklist (American Psychiatric Association, 2000), and Drug and Alcohol Follow-back Calendar (New Hampshire Dartmouth Psychiatric Research Center, 1995).

Yet the Housing First evidence base has several notable limitations (Trilling, 2016). Criticisms include an overlap between Housing First developers and evaluators—elevating the potential for conflicts of interest (Groton, 2013), limited evidence regarding the efficacy of Housing First in reducing substance misuse (Clifasefi et al., 2016), methodological inconsistencies in outcome monitoring (Groton, 2013; Trilling, 2016), and overgeneralization in Housing First's implementation, particularly at the policy level (Clifasefi et al., 2016; Johnson et al., 2012; Trilling, 2016).

Research among those experiencing chronic homelessness is also scant, and questions remain as to how to best link Housing First residents with critical health services. Transportation barriers (Bancroft, 2012), neighborhood security concerns (Hsu et al., 2016), and exclusionary bans from areas surrounding vital services (Bancroft, 2012) may temper treatment accessibility as well as perceptions of choice (Macnaughton et al., 2015). In-home behavioral health services stand to mitigate some of these barriers. An evaluation of a supportive housing program in Portland, Oregon highlighted associations between offering on-site services, substantial declines in healthcare expenditures, and concurrent reductions in ER use and inpatient treatment (Wright et al., 2016). Excluding studies of Assertive Community Treatment, which emphasizes community-based and in-home services (Aubry et al., 2016) and research demonstrating that integrated auxiliary services improve housing stability and psychiatric symptoms (McHugo et al., 2004), in-home behavioral health research among Housing First participants is limited. This study aimed to address this gap by evaluating outcomes from a novel in-home behavioral health program for Housing First residents with chronic health conditions (including physical health, mental health, and substance misuse).

## Methods

### Program Description

This evaluation examined data from Access to Wellness (ATW), an evidence-based, in-home behavioral health program developed by the AIDS Foundation of Chicago and funded by the Substance Abuse and Mental Health Services Administration (SAMHSA). ATW is a recovery-oriented program constructed to improve the health and stability of individuals confronting chronic homelessness. The program combined a Housing First model with evidence-based behavioral health services delivered in participants' homes.

Program interventions incorporated two evidence-based practices (EBPs) identified by SAMHSA—Screening, Brief Intervention, and Referral to Treatment (SBIRT) and Motivational Interviewing (MI). Trained clinicians delivered SBIRTs in participants' homes. SBIRT is an integrated public health method that comprises three main elements: rapid, standardized screening to assess substance misuse severity and identify appropriate treatment level; brief intervention aimed at fostering participants' awareness and insight into their substance misuse; and referral to substance misuse and mental health treatment as indicated (Substance Abuse and Mental Health Services Administration, 2015). The

SBIRT strategy has a promising degree of empirical support and is associated with decreased frequency and severity of drug and alcohol use, increased use of specialized substance misuse treatment, and lower rates of ER use and inpatient hospitalization (Aldridge et al., 2017; Gryczynski et al., 2011; Pecoraro et al., 2012).

ATW service providers implemented a modified form of SBIRT which focused on mental health concerns in addition to SBIRT's typical emphasis on problematic substance use. Empirical support for similar modifications is limited; however, Topitzes et al. (2017) altered the SBIRT format to screen for both trauma and alcohol misuse among primary care patients and noted favorably high referral rates to specialized treatment. ATW also incorporated MI techniques to address participants' ambivalence toward seeking traditional substance misuse or mental health services in specialty settings. MI is a client-centered, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence (Rollnick & Miller, 1995).

The ATW program was staffed by a three-person clinical team that included a Mental Illness and Substance Abuse Counselor, a Certified Alcohol and Drug Counselor, and a Registered Nurse. Both clinicians and agency-based case managers (to whom each participant was assigned) were trained to use MI. ATW supplemented these low-threshold EBPs with health assessments and brief mental health or substance misuse counseling provided by study clinicians in participants' homes.

## Participants

One hundred thirty-three participants completed surveys at enrollment. All program participants had at least one chronic physical health condition (including, but not limited to, HIV/AIDS), as well as frequent co-occurring mental health and substance misuse. Prior to program entry, participants were screened to confirm their status as chronically homeless per HUD criteria. Participants resided in scattered-site or project-based apartments in the Chicago area. The sample had slightly more men (53%) than women (47%) and was primarily African American (69%). Participants ranged in age from 20 to 72, with a mean of 46 years. Monthly income was low at enrollment ($M$=$984, $Mdn$=$952) and remained low at 6-month follow-up ($M$=$1067, $Mdn$=$974). Disability benefits (Social Security Disability Income or Supplemental Security Income) and other forms of public assistance were the most common income sources. A majority of participants (82%) had mental health symptoms at enrollment, while 45% had substance misuse symptoms, and 39% had co-occurring disorder symptoms.

## Procedure

Trained evaluators administered paper-pencil versions of the Center for Substance Abuse Treatment Government Performance and Results Act (GPRA) tool at program enrollment and 6-months and 12-months post-enrollment (SAMHSA, 2012). Evaluators compensated participants with incentives for their time (gift cards valued at $10 at baseline and $20 for each follow-up). Data were collected for program evaluation and project improvement purposes and released to the study authors for secondary analysis. All data were de-identified and stored on password-protected computers accessible only to the study

authors. The study received an exempt determination from the principal investigator's university for the secondary analysis.

### Variables and Measures

Participant demographic variables, health variables, and ER and inpatient hospitalization outcomes were included in the analysis and described below. Program use variables (SBIRTs, case management encounters, and mental health and substance misuse counseling treatment hours) were inconsistently reported and exhibited large amounts of missing data, precluding imputation or process evaluation (Saunders et al., 2006; Stefancic et al., 2004).

**Demographic variables**. Demographic variables were gender, race, age, income, and health insurance status. Participants self-reported gender, race, and insurance status at study enrollment and age and income at both enrollment and 6-month follow-up. Options for gender included male, female, or transgender. Participants could select multiple racial and ethnic categories (African American, Asian American, Native Hawaiian or Pacific Islander, Alaska Native, White, American Indian, and Hispanic or Latino). The researchers dichotomized these responses as African American or Other Race to compensate for low cell counts and to simplify demographic analyses (Murad et al., 2003). Evidence that distinct, systemic factors influence African Americans' entry into homelessness prompted the evaluators to include race as a demographic variable (Jones, 2016). Age was a continuous variable reported in years. Monthly income was also continuous and included income earned from wages; public assistance, retirement, and disability benefits; non-legal sources; financial contributions from friends and family; and other sources. Participants also reported if they had health insurance.

**Health variables.** Health variables included screening positive or negative for substance misuse symptoms, mental health symptoms, or co-occurring symptoms, using the 16-item self-report Substance Abuse and Mental Illness Symptoms Screener (SAMISS). The SAMISS is a screening instrument designed to identify substance misuse, mood and anxiety disorders. It has an 86% sensitivity and a 75% specificity for substance misuse and a 95% sensitivity and 49% specificity for mental disorders when compared to the Structured Clinical Interview for DSM-IV (Breuer et al., 2012, 2014).

**Outcome variables.** Self-report tools assessed participants' ER visits and inpatient hospitalizations at program enrollment and 6- and 12-months post-enrollment. A dichotomous variable indicated if respondents reported ER use or inpatient hospitalization for any reason (physical, mental, or substance misuse) in the 30-days prior to each data collection point. ER visits and inpatient hospitalizations at enrollment and 6-months functioned as the primary outcomes. Neither outcome variable had missing data at enrollment. Ten participants were missing ER and inpatient hospitalization data at 6-month follow-up for the following reasons: discharge for program violation (*n*=1), discharge due to incarceration (*n*=1), and missingness for unknown reasons (*n*=8). Nine additional participants were discharged between 6- and 12-month follow-up for reasons including death (*n*=5), involuntary discharge for nonparticipation (*n*=1), involuntary discharge for program violation (*n*=1), voluntary discharge against staff recommendation (*n*=1), and

discharge for unknown reasons (*n*=2). At 12-month follow-up, inpatient hospitalization data were missing for 43 participants (32%) and ER visit data were missing for 44 participants (33%) for unknown reasons. To prevent erroneous generalizations from these data (Benston, 2015; Dumville et al., 2006) and in the absence of rigorous explanatory factors to substantiate imputation (Saunders et al., 2006; Thabane et al., 2013), the researchers excluded 12-month follow-up data from the analysis.

**Analysis**

Univariate statistics were calculated to describe the sample (*n*=133). The authors conducted chi-square analyses to compare self-reported ER use and inpatient hospitalization outcomes at baseline and 6-month follow-up for each demographic and health factor. McNemar's chi-square was used for repeated measures analyses. The researchers employed non-parametric tests rather than a technique such as linear regression because ER and inpatient data were not normally distributed (Ghasemi & Zahediasl, 2012; McHugh, 2013). We also applied maximum likelihood chi-squares when minimum expected cell count assumptions were violated (McHugh, 2013). ER data proved non-normally distributed based on a significant Shapiro-Wilk value (*p*<.001), skewness of -0.17 (*SE*= 0.22) and kurtosis of 4.72 (*SE*=0.43). Inpatient data was also non-normally distributed as evidenced by a significant Shapiro-Wilk value (*p<.001*), skewness of 4.04 (*SE*= 0.22), and kurtosis of 31.39 (*SE*=0.43). After excluding participants with missing data, a smaller sample (*n*=123) was available for repeated measures analysis. Bivariate results highlighted relationships that were statistically significant (*p*<.05) or marginally significant (*p*<.10) (Dahiru, 2008; Wainer & Robinson, 2003). Due to sample size limitations, multivariate analyses were not conducted.

## Results

Univariate and bivariate analyses are depicted in Table 1. During the 30 days preceding baseline data collection, 17% of participants reported ER visits and 11% reported inpatient hospitalizations. By 6-month follow-up, 24% of participants reported ER visits and 11% reported inpatient hospitalizations. Chi-square analysis underscored an assortment of marginally significant associations within these data. Changes in ER use between program enrollment and 6-month-follow-up were not statistically significant according to McNemar's chi-square test. No psychiatric symptoms were associated with ER visits or inpatient hospitalizations at either intake or 6-month follow-up.

Several variables maintained marginally significant (*p*<.10) associations with acute care outcomes. For instance, participants with inpatient hospitalizations at enrollment were males (73%) by a marginally significant majority above females (27%), $\chi^2$ (1, *n* = 132) = 2.80, *p* = .094, *V*=.15. This gender disparity continued at 6-month follow-up, at which time males were responsible for 71% of inpatient visits and females for 29% of inpatient visits, $\chi^2$ (1, *n* = 122) = 2.91, *p* = .088, *V*=.15. Gender was not related to ER visits. At enrollment (but not at 6-month-follow-up), African Americans composed a higher proportion of inpatient hospitalization users (87%) than other racial groups (13%), maximum likelihood ratio $\chi^2$ (1, *n* = 133) = 2.78, *p* = .095, *V*=.135.

Table 1. *Univariate Analysis of Sample Descriptives and Bivariate Analysis of Inpatient Visits and ER Visits Collected at Intake and Six Months*

| | | n (%) | | | |
| | | Intake | | 6 Months | |
| **Independent Variables** | Sample *n* (%) | Inpatient Hospital Visits (*n* = 15, 11%) | ER Visits (*n* = 22, 17%) | Inpatient Hospital Visits (*n* = 14, 11%) | ER Visits (*n*= 29, 24%) |
|---|---|---|---|---|---|
| Gender: Male (Cisgender) | 70 (53%) | 11 (73%)* | 9 (41%) | 10 (71%)* | 15 (52%) |
| Race: African American | 92 (69%) | 13 (87%)* | 14 (64%) | 12 (86%) | 19 (65.5%) |
| Insured at Intake | 62 (63%) | 11 (85%)* | 11 (73%) | 7 (70%) | 16 (70%) |
| Mental Health Problem | | | | | |
|    Screened Positive Intake | 108 (81%) | 13 (87%) | 20 (91%) | 11 (79%) | 25 (86%) |
|    Screened Positive 6 mo. | 95 (78%) | -- | -- | 11 (85%) | 25 (86%) |
| Substance Abuse Problem | | | | | |
|    Screened Positive Intake | 59 (44%) | 8 (53%) | 10 (46%) | 8 (57%) | 12 (41%) |
|    Screened Positive 6 mo. | 39 (32%) | -- | -- | 6 (46%) | 8 (30%) |
| Dual Disorder Problem | | | | | |
|    Screened Positive Intake | 52 (39%) | 8 (53%) | 10 (46%) | 7 (50%) | 10 (34%) |
|    Screened Positive 6 mo. | 36 (30%) | -- | -- | 6(46%) | 8 (30%) |
| | | M (range) | | | |
| Age (years) | 46 (20-72) | 49 (24-71) | 43 (23-57) | 50 (33-61) | 47 (23-61) |
| Monthly Income ($) | | | | | |
|    At Intake | $984 ($91-2606) | $1159 ($0-1973) | $ 1111 ($0-2252) | $1009 ($0-1585) | $1025 ($0-2359) |
|    At 6 mo. | $1067 ($0-2607) | -- | -- | $1063 ($0-1659) | $1195 ($0-2607) |

*$p<.10$

Notes. The participant who identified as transgender was not included in the bivariate analyses of gender and ER use and hospitalization. Actual n for each analysis ranged from 88 to 133, depending on the amount of missing data.

Insured participants constituted a higher proportion (85%) of those hospitalized at intake than uninsured participants (15%), maximum likelihood ratio $\chi^2$ (1, $n = 98$)= 3.30, $p$ = .069, $V$=.173; this relationship was absent at 6-month-follow-up. Furthermore, being insured was not associated with ER utilization. Finally, neither participant age nor income was associated with ER use or hospitalization.

## Discussion

Although the proportion of ATW ER users increased (from 17% to 24%) between baseline and follow-up, neither ER visits nor inpatient hospitalizations displayed statistically significant changes. Generally, Housing First residents' health stabilizes over time (Jaworsky et al., 2016), so the distinction between current findings and extant research could be salient. Twelve-month data exclusion and the resulting brevity of the study's follow-up period (6 months) compared with prior research (e.g., Leff et al., 2009) may have contributed to the absence of statistically significant acute care changes. Outcomes could also be an artifact of a floor effect, signifying that more sensitive measures are needed. That said, we suggest that the lack of a significant increase in acute care use may denote a short-term stabilization effect given the poor health trajectories of many formerly homeless individuals, even after permanent supportive housing enrollment (Henwood et al., 2015; 2018).

By monitoring participants who use acute care services post-enrollment, Housing First program managers and service providers could begin to identify if participants possess distinctive features, targeting services accordingly. Kerman et al. (2018) identified subgroups of Housing First consumers who—similar to the present study's participants— did not display diminished service utilization after Housing First enrollment and argued that consumers' discrepant housing stability levels mediated these differences. Consequently, housing stability measures may enhance outcome monitoring and service planning among social workers practicing in a Housing First context. Using assessment tools to systematically evaluate consumers' individualized needs and collaboratively and responsively allocate services is consistent with the ethos of evidence-based social work practice (Chonody & Teater, 2018; Drisko, 2014). This practice also embodies social workers' ethical responsibility to practice in a manner that maximizes consumer self-determination and demonstrates competence and commitment to clients (National Association of Social Workers, 2017). Because Housing First is an inherently flexible model—in contrast, for example, to manualized interventions—finding ways of efficiently and effectively tailoring services to meet Housing First residents' varying needs is a priority area for further social work research and practice (Henwood, Cabassa, et al., 2013).

Gender differences were notable, if not generalizable, in our evaluation—specifically, cisgender males' elevated inpatient use. Evidence for systematic gender differences in hospitalization among Housing First residents (Srebnik et al., 2013) and the utility of tailoring programs to address sociodemographic differences is inconclusive (Peressini, 2007). Male ATW participants' elevations in inpatient hospitalization may stem from an increased incidence of health problems that necessitated admission but were not captured by study tools. Obtaining consumers' consent to coordinate care between area hospitals and housing services could improve social work practice by enhancing interprofessional

collaboration and the continuity of care, as well as clarify the possible sources of this gender discrepancy. A group of Australian investigators noted that involving hospital staff more seamlessly in supportive housing was associated with reductions in hospitalizations (Wood et al., 2019). Likewise, comparisons of programs integrating housing and auxiliary services with scattered services reinforce the importance of service integration, especially among males (McHugo et al., 2004).

Relationships between race and hospitalization also differ across studies. For instance, white, homeless women who misused substances exhibited higher rates of hospitalization than other racial groups in an investigation conducted by Gelberg et al. (2009), but disparities diminished after controlling for vulnerability factors (e.g., psychiatric hospitalization, abuse history, pregnancy). In the present evaluation, African American consumers had higher levels of inpatient hospitalization at enrollment but not at 6-month follow- up. Though ATW services may have reduced repeat hospitalization among African Americans, some evidence suggests that housing stability itself is associated with improved health outcomes (Jaworsky et al., 2016; Kerman et al., 2018). This is important to consider in light of the over-representation of African Americans among people experiencing homelessness. In 2019, HUD found that African Americans composed 40% of the homeless population but only 13% of the US population (Henry et al., 2020). Further research and evaluation could establish if ATW lowered engagement barriers associated with perceived racial stigma and service avoidance (Skosireva et al., 2014; Weisz & Quinn, 2018) with aims to adopt anti-oppressive practices at both the direct practice and systems level (Stergiopoulos et al., 2016).

In contrast to our predictions, substance misuse and co-occurring symptoms were not significantly related to ER visits or hospitalizations. Persons navigating homelessness with substance misuse and co-occurring disorders are historically prone to ER visits and hospitalizations, even relative to other chronically ill individuals (Lin et al., 2015; Minassian et al., 2013). Access to in-home behavioral health services and permanent supportive housing appears to have stabilized or, for some subgroups (African Americans), reduced ER and inpatient use. If these findings are reflective of lower psychiatric morbidity among ATW consumers, they could also inform the nature of ATW's services. For example, MI experts suggest that MI appears less effective—or potentially even contraindicated— among those demonstrating readiness for change, suggesting that as ATW consumers' behavioral health stabilizes, alternative interventions may become more appropriate (Hettema et al., 2004).

Insured participants' elevated rates of hospitalization at enrollment may result from lowering treatment barriers that typically persist for those living as homeless, despite obtaining access to health insurance. Indeed, other investigators found that publicly insured individuals experiencing homelessness use both more ambulatory and acute care services—even in nations offering universal healthcare (Hwang et al., 2013; Lin et al., 2015). By including pre-enrollment and post-enrollment insurance data, ATW could clarify if consumers who are uninsured before enrollment account for a disproportionate number of hospitalizations and whether those stabilize over time. If this trend exists, it might suggest that high baseline hospitalizations are a function of addressing previously unmet healthcare needs. If supported, this finding could impact social work evaluation and

practice, suggesting that lacking insurance pre-enrollment is an indicator that a participant may benefit from additional staff support. In addition to linking participants to health insurance resources, this support should include referring service users to free or low-cost preventative care and screening programs to identify and treat underlying health conditions. Federally qualified health centers and clinics funded through the Health Care for the Homeless program offer excellent resources for linking currently or formerly homeless individuals to essential healthcare services (Zlotnick et al., 2013).

**Limitations**

This program evaluation study has several limitations. The evaluation relied on program data collected and entered by a large team of staff across multiple locations, limiting the researchers' oversight of collection procedures and resulting in considerable missing data for some variables. Missing data and the small size of the sample prevented multivariate analyses and led to the exclusion of both behavioral health intervention data (relating to SBIRTs, case management interventions, etc.) and 12-month follow-up outcomes from data analyses. Regardless of associations between demographic variables and hospitalizations within the ATW data, the evaluation's methodology prohibits causal inferences and prevents the evaluators from dismantling which factors (e.g., housing, in-home behavioral health, demographic factors) mediated outcomes. Another limitation lies in our operationalization of chronic homelessness. In 2015, after data collection supporting the present evaluation ceased, HUD adopted a revised definition of chronic homelessness which required discrete episodes to meet or exceed a 12-month aggregate (U.S. Department of Housing and Urban Development, 2015). The revised definition captured the heaviest users of shelters and, in effect, targeted those most in need of housing support (Byrne & Culhane, 2015). Since the former definition served as an inclusion criterion, program participants may comprise a group less prone to housing instability than chronically homeless individuals under the current definition (Byrne & Culhane, 2015). Program effectiveness may be resultantly understated, as Housing First now targets higher-risk persons than during data collection.

The exclusion of fidelity measurements for behavioral health interventions represents another study limitation, meaning that SBIRT or MI interventions may have varied in their adherence to evidence-based protocols. While challenges to ensuring treatment fidelity in a supportive housing environment are not exclusive to the ATW program, the issue is nonetheless deserving of attention based on potential treatment outcome implications (McGraw et al., 2010). Several fidelity measures for SBIRT and MI do exist for application to future research and practice, although they are in varying stages of development and psychometric validation (Moyers et al., 2005, 2016; Pantalon et al., 2012; Vendetti et al., 2017).

Self-report biases are a fundamental concern to researchers of homeless health disparities (Gelberg & Siecke, 1997). Factors associated with under- or over-reporting of health care use among homeless research participants include recall period (Clifasefi et al., 2011; Somers et al., 2016), alcohol use severity (Clifasefi et al., 2011), service type (e.g. psychiatric hospitalization or ER use; Somers et al., 2016), an active mental health diagnosis (Hwang et al., 2016), and homelessness chronicity of two years or greater

(Somers et al., 2016). Despite these factors, Hwang et al. (2016) and Somers et al. (2016) supported the use of self-reports with the homeless population, citing their overall consistency with administrative records.

## Conclusion

Chronic homelessness is a potent risk factor for repeat hospitalization, which ambulatory care alone does not adequately address. Housing First inverts treatment-as-usual by prioritizing permanent supportive housing without requiring psychiatric stabilization, lowering morbidity and mortality rates. Consumers' relatively low rate of ER use and hospitalization is noteworthy, considering that all consumers had chronic physical health or psychiatric diagnoses, perhaps reflecting the potency of addressing structural barriers via in-home behavioral health services. Males' marginally higher inpatient use may merit tailored services, although program administrators and direct service staff should continue to monitor these outcomes to see if they persist. Reductions in African Americans' inpatient use also warrant ongoing evaluation to determine if they are sustained by current ATW consumers or are reproducible among future cohorts. Subsequent research should employ fidelity metrics and more robust designs, such as randomized controls, to compare outcomes for Housing First residents receiving in-home health services to usual care (linking participants with community providers). Such research could inform the design of evidence-based service packages to reduce hospital use and improve health outcomes. This issue remains critical as the social work profession strives to reduce health disparities and ensure health equity for marginalized groups, including formerly homeless individuals enrolled in Housing First programs.

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