Original article

Impact of supportive housing on substance use–related health care utilization among homeless persons who are active substance users

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ABSTRACT

Purpose: Homeless persons with a substance use disorder (SUD) are at high risk of emergency department (ED) visits and hospitalizations. We evaluated the impact of supportive housing on SUD-related ED visits and hospitalizations among active substance users experiencing chronic homelessness.
Methods: We matched 1558 homeless adults eligible for a New York City supportive housing program who had a SUD (2007–2012) to Medicaid claims data. We examined SUD-related hospitalizations and ED visits 2 years posteligibility. We calculated stabilized inverse probability of treatment weights using baseline demographic and clinical characteristics and used doubly robust estimators to compare rates between persons placed into supportive housing and those eligible but not placed. We also examined outpatient SUD treatment.
Results: Placed persons were hospitalized and visited EDs for substance use at significantly lower rates than persons not placed into housing (adjusted rate ratio, 0.70; 95% confidence interval, 0.56–0.88 and adjusted rate ratio, 0.46; 95% confidence interval, 0.31–0.68, respectively) 2 years posteligibility. Placed persons had increased odds of a new episode of SUD treatment and initiating treatment.
Conclusions: Supportive housing placement was associated with decreases in SUD-related hospitalizations and ED visits and with increased odds of new episodes of SUD outpatient treatment among homeless persons with SUD.

Introduction

Substance use disorders (SUD) are an important public health concern among persons experiencing homelessness. National surveys of the United States' homeless population have found that drug and alcohol use is highly prevalent [1–3]. There is strong evidence for a relationship between substance use, SUDs, and homelessness, although the directionality is unclear [4–6].

Persons experiencing homelessness have high levels of acute health service utilization [7–10]. This is due in part to the fact that the homeless population is disproportionately burdened with higher levels of poor physical and mental health and less access to care when compared with the general population [1,2,7].

Supportive housing is subsidized, permanent, and community-integrated housing for individuals with a SUD or mental health disorder who are experiencing homelessness and offers a wide range of supportive social services [11]. Multiple studies have found that, among homeless populations, supportive housing can improve housing stability, and active substance users experiencing homelessness can be successfully housed long term [12,13]. Persons in supportive housing programs have been shown to achieve reductions in hospitalizations, emergency department (ED) visits, and use of emergency medical services [13–17] and also report reductions in their use of drugs and alcohol [18,19].

Despite growing evidence of the positive impacts of supportive housing among active substance users, existing studies have examined one or two SUD-related outcomes, or nonspecific health care utilization. Thus, there is a need to assess the effect of supportive housing on a more complete set of SUD-specific outcomes, including SUD-related ED visits, hospitalizations, and outpatient treatment. This analysis aimed to evaluate the impact of a New York City–based supportive housing program on the rate of SUD-related ED visits and hospitalizations among chronically homeless adults who were active substance users by comparing those placed into supportive housing with those who were eligible but not placed. We also examined process-based measures of outpatient substance

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use treatment. Finally, we described the leading diagnoses for alcohol- and drug-related ED visits and hospitalizations within this population.

Material and methods

New York/New York III

New York/New York III (NYNY III), a partnership between New York State and New York City, is a large-scale, multiagency initiative to create 9000 units of supportive housing [15,20]. This program specifically targets individuals who are chronically homeless and who have a severe mental illness or SUD, heads of household with severe mental illness or SUD who are at risk of homelessness, and young adults who have recently aged out of foster care (aged 18–25 years). For NYNY III eligibility, chronic homelessness was operationalized as having lived on the street or in a shelter for at least 12 of the past 24 months or at least two of the past 4 years. Individuals work with social service caseworkers, often shelter staff, to apply to New York City's Human Resources Administration for supportive housing. The caseworker includes the results of an individual's comprehensive psychiatric evaluation as part of the supportive housing application [20]. Given that housing is limited, eligible applicants are given referrals to housing providers based on their length of time homeless (e.g., persons who have experienced longer periods of homelessness are given higher priority) and availability of units. Housing providers then select their residents from among persons whom they have interviewed. A more detailed description of the program has been published [15,20]. This evaluation focused on individuals who were eligible for housing in 2007–2012 and who were not seeking treatment for their SUD at the time of their housing application.

For evaluation purposes, the cohort of NYNY III eligible persons is linked with administrative data on use of public benefits such as Supplemental Nutrition Assistance Program, services and housing for people living with HIV or AIDS, city shelters, Medicaid, jail incarceration, New York State psychiatric hospitals, and HIV or sexually transmitted infection diagnoses from 2005 through 2014 (i.e., 2 years before eligibility and 2 years posteligibility for each individual). These datasets are probabilistically matched at the New York City Department of Health and Mental Hygiene to create a deidentified dataset for analysis.

All persons who were eligible for NYNY III signed a consent permitting their data to be shared for evaluation purposes. The New York City Department of Health and Mental Hygiene Institutional Review Board determined this study to be program evaluation and not human subjects research and therefore not under its purview.

Study population

For this analysis, among 28,198 NYNY III eligible applicants, we included only persons aged 18 years or older who had a clinician-verified SUD diagnosis and who were not currently in treatment for their disorder (i.e., persons were presumed to be active substance users) at the time of their eligibility. We also excluded persons who had no days of Medicaid eligibility during our follow-up study period ($n = 31$) because of our reliance on Medicaid data to ascertain outcomes. Our final analytic sample included 1558 persons. We compared persons who were first eligible for housing and subsequently placed into NYNY III housing for more than 7 days ("placed") with persons who were eligible but placed into NYNY III for 7 days or less or not at all and who were not placed into any other supportive housing within 6 months of their NYNY III eligibility ("unplaced"), from 2007 through 2012. This 7-day cut-off was considered to be sufficient to allow an individual to receive the

minimum benefit of supportive housing. We considered someone as being placed (i.e., received the intervention) even if they left NYNY III supportive housing during the study period. Conversely, unplaced individuals were still considered to be unplaced even if after 6 months they were subsequently placed into another government-subsidized supportive housing program.

Outcome definition

Our main outcomes of interest were SUD-related ED visits and hospitalizations during the 2 years after program eligibility. Outcomes were identified using Medicaid claims and encounters data and considered to be SUD-related if any of the following International Classification of Diseases, Ninth Revision, Clinical Modification codes were listed as the principal diagnosis: alcohol- or drug-induced mental disorders (291, 292); alcohol or drug dependence (265.2, 303, 357.5, 425.5, 535.3, 304); nondependent abuse of alcohol or drugs (305.0, 305.2–305.9); alcoholic neuropathy, cardiomyopathy, gastritis, hepatitis, and cirrhosis of the liver (357.5, 357.6, 425.5, 535.3, 535.30, 535.31, 571.0, 571.1, 571.2, 571.3); alcohol or drug poisoning (980.0, 965, 967, 969, 970, 968.0, 968.5); and alcohol or drug use complicating births (648.30–648.34, 655.50, 655.51, 655.53, 760.71, 760.72, 760.73, 760.75, 779.5).

For secondary outcomes, we examined Washington Circle's validated substance use treatment performance measures [21,22]. These process of care measures include the proportion of applicants who were identified as having a new SUD claim after a 60-day period without one ("identification"); the proportion among those identified who then initiated treatment within 14 days of the index SUD service ("initiation"); and the proportion, among those who initiated treatment, who then engaged in two or more visits within 30 days ("engagement"). All our secondary outcomes were examined within 2 years of the first date of NYNY III eligibility. Treatments were defined as any service that listed a SUD-related International Classification of Diseases, Ninth Revision, Clinical Modification code from above as the primary diagnosis and occurred at an outpatient facility and could have included visits for methadone maintenance and alcohol and drug detoxification, for example.

We also described the leading principal diagnoses of ED visits and hospitalizations using the categories of principal diagnosis codes listed previously.

Statistical analysis

We first described the characteristics of the placed and unplaced groups, using χ^2 tests and t tests to examine statistically significant differences between them. Next, as placement into supportive housing was not random, we accounted for inherent differences in group characteristics using propensity score methods. First, we used a logistic regression model to derive an individual's probability of placement into housing (i.e., propensity score), which included baseline demographics, physical and mental health characteristics, substance use patterns, and prior costs of Medicaid, public benefits, incarceration, and shelter use (see Appendix for complete list). We then calculated inverse probability of treatment weights (IPTW), which we stabilized by multiplying the IPTW by the marginal probability of treatment (i.e., placement into housing.) We examined standardized differences [23] for these characteristics before and after IPTW to determine whether we had achieved balance between the placed and unplaced groups (Appendix). For each outcome, we used multivariable models with Generalized Estimating Equations where the initial variables from our propensity score model were again used as covariates, creating doubly robust estimators. This approach has been proven to be more

effective in addressing bias due to model misspecification than a regression model with only IPTW [24].

For ED visits and hospitalizations, we used negative binomial regression with the natural log of the number of Medicaid-eligible person-days as an offset term to compare rates between persons who were placed into supportive housing with those who were eligible but not placed. For the outpatient treatment outcomes, we used separate logistic regression models to compare the odds of SUD treatment identification, initiation, and engagement, respectively. We used χ^2 tests to determine statistically significant differences in the leading diagnoses for ED visits and hospitalizations between placed and unplaced persons. Prior analyses of Medicaid data have shown that a small proportion of users account for more than half of all Medicaid expenditures [25], and our own data showed a highly right-skewed distribution in the number of ED visits and hospitalizations per person. Therefore, we ran a sensitivity analysis using the previously mentioned models on a sample that excluded individuals whose number of ED visits or hospitalizations were 95th percentile or greater. Statistical significance was determined using two-sided $P < .05$. All analyses were conducted using SAS Enterprise Guide version 7.13 (SAS Institute, Cary, NC).

Results

Our sample comprised 827 placed applicants and 731 unplaced applicants. Both groups were mostly male (88% among placed, 85% among unplaced, $P = .12$), and the mean age at eligibility was 48 years (SD = 11.5), with no significant difference between the two groups (Table 1). Non-Latino Blacks and Latinos comprised the majority of the study sample, although the unplaced group had a higher proportion of non-Latino Whites ($P = .0003$). Almost 60% of placed persons and 68% of unplaced persons had a mental illness comorbid to their SUD ($P = .0006$), and a higher proportion of unplaced applicants were prescribed a psychotropic medication ($P < .0001$). Both groups were similar in levels of education, incarceration within the past 2 years, and substance use patterns at the time of program eligibility. Based on self-report at the time of the supportive housing application, alcohol was the most commonly misused substance by both groups, followed by cannabis and cocaine. These observed differences were well balanced via IPTW, resulting in exchangeability between placed and unplaced groups (Appendix).

Two years after program eligibility, we found that among placed applicants, 170 (20%) visited the ED for SUD at least once, for a total of 856 ED visits, and 211 (26%) were hospitalized at least once for SUD, for a total of 697 hospitalizations (Table 2). In contrast, among the unplaced applicants, 230 (32%) visited the ED for SUD for a total of 2589 ED visits, and 36% were hospitalized for SUD for a total of 1216 hospitalizations. We observed lower unadjusted rates for SUD-related ED visits among the placed group (5.1 vs. 13.4 per 1000 Medicaid-eligible days, respectively). The unadjusted rate for SUD-related hospitalizations was significantly lower among placed individuals than unplaced, at 4.5 versus 6.4 per 1000 Medicaid-eligible days.

After accounting for confounding via multivariable Poisson regression analysis, we found that persons placed into supportive housing visited EDs and were hospitalized for SUD at significantly lower rates than persons who were not placed into housing (adjusted rate ratio, 0.46; 95% CI, 0.31–0.68 and adjusted rate ratio, 0.70; 95% CI, 0.56–0.88, respectively; Table 2). A sensitivity analysis that excluded outliers of 95th percentile or greater for number of ED visits and hospitalizations yielded similar results (data not shown).

We also found that within 2 years of program eligibility, placed persons had increased odds of having a new SUD outpatient

Table 1
Selected characteristics of active substance users eligible for a supportive housing program, 2007–2012

Characteristics	Placed n (%)	Unplaced n (%)	P*
Total applicants	827	731	
Applicant characteristics			
Mean age at eligibility (SD)	48.0 (12.0)	48.3 (10.8)	.6164
Gender			.1182
Female	103 (12.5)	111 (15.2)	
Male	724 (87.6)	620 (84.8)	
Race and ethnicity			.0003
Non-Latino White	104 (12.6)	146 (20.0)	
Non-Latino Black	495 (59.9)	385 (52.7)	
Latino	216 (26.1)	179 (24.5)	
Asian or other race or ethnicity	12 (1.4)	21 (3.9)	
Education			.8132
<High school	374 (45.2)	321 (43.9)	
High school diploma or higher	426 (51.5)	383 (52.4)	
Other	27 (3.3)	27 (3.7)	
Comorbid mental illness (other than SUD)			.0006
Yes	489 (59.1)	494 (67.6)	
No	338 (40.9)	237 (32.4)	
Currently taking psychotropic medication			<.0001
Yes	163 (19.7)	219 (30.0)	
No	664 (80.3)	512 (70.0)	
Incarcerated during 2 y before eligibility			.5361
Yes	207 (25.0)	193 (26.4)	
No	620 (75.0)	538 (73.6)	
Mean days of Medicaid eligibility during follow-up period (SD)	581.8 (173.1)	551.9 (189.5)	.0012
Substance use			
Substance use pattern			.1615
Less than weekly	69 (9.5)	59 (9.6)	
Once a week	83 (11.4)	50 (8.2)	
Several times per week	282 (38.8)	252 (41.1)	
Daily	230 (31.7)	184 (30.0)	
Unknown	62 (8.5)	68 (11.1)	
Missing	101	118	
Substances used (not mutually exclusive)			
Alcohol	514 (62.2)	435 (59.5)	.2857
Cannabis	230 (27.8)	193 (26.4)	.5325
Cocaine	155 (18.7)	124 (17.0)	.3606
Crack	93 (11.3)	86 (11.8)	.7484
Opiates	83 (10.0)	68 (9.3)	.6251
Sedatives	19 (2.3)	8 (1.1)	.0694
Amphetamines, hallucinogens, phencyclidine (PCP), or other	37 (4.5)	33 (4.5)	.9694

SUD = substance use disorder.
* χ^2 test or t test, as appropriate.

treatment (identification; adjusted odds ratio, 1.78; 95% CI, 1.40–2.27) and initiating treatment within 14 days (adjusted odds ratio, 1.66; 95% CI, 1.01–2.74) than unplaced persons (Table 3). Although more than 80% of those who initiated SUD treatment subsequently engaged in two or more visits within a 30-day period, there was no significant difference in engagement between placed and unplaced persons.

The leading principal diagnosis categories for ED visits and hospitalizations are shown in Table 4. The most frequent principal diagnosis for SUD-related ED visits for both placed and unplaced individuals was nondependent alcohol abuse (59% vs. 65%, $P = .0023$), followed by alcohol dependence (24% vs. 27%, $P = .05$). We found that ED visits for opioid dependence and nondependent opioid abuse were significantly higher among placed persons than unplaced persons. The leading principal diagnosis for hospitalizations was alcohol dependence for both placed and unplaced (>50% for both, $P = .77$). A higher proportion of unplaced persons were hospitalized with alcohol-induced mental disorders than placed

Table 2
ARRs for substance use hospitalization and ED visits among active substance users eligible for a supportive housing program, 2007–2014*

Supportive housing status	Substance use–related ED visits				Substance use–related hospitalizations			
	Total with ED visit, n (%)	Total ED visits	Rate per 1000 Medicaid-eligible days (SD)	ARR (95% CI)	Total hospitalized, n (%)	Total hospitalizations	Rate per 1000 Medicaid-eligible days (SD)	ARR (95% CI)
Placed	170 (20.1)†	856	5.1 (18.3)	0.46 (0.31–0.68)†	211 (25.5)†	697	4.5 (7.2)	0.70 (0.56–0.88)†
Unplaced	230 (31.5)†	2589	13.4 (63.3)	Ref	261 (35.7)†	1216	6.4 (8.7)	Ref

ARR = adjusted rate ratio; ED = emergency department; SD = standard deviation.
* See appendix for model covariates.
† P < .05.

persons (20.2% vs. 15.8%, P = .0181), and placed persons had a higher proportion who were hospitalized for cocaine dependence (6.7% vs. 3.0%, P = .0001). The remaining categories did not differ significantly between groups.

Discussion

In this evaluation of chronically homeless persons who actively used drugs and alcohol in New York City, we found that placement into supportive housing had a significant impact on the rate of alcohol- and drug-related ED visits and hospitalizations. Those in supportive housing were also more likely to initiate outpatient SUD treatment.

The results of our evaluation are similar to other studies of supportive housing programs. An interim report on NYNY III had a similar, although more limited, result to ours; namely, it found that persons who received housing had lower rates of SUD-related ED visits and hospitalizations within the first year of eligibility [15]. Our study showed that these lower rates persisted over two years, and specifically within a population of active substance users who were not receiving treatment for their SUD. A separate analysis of NYNY III limited to placed applicants with a SUD showed that longer stays in supportive housing were associated with lower rates of hospitalizations and ED visits [13]. A Seattle-based supportive housing program for adults with severe alcohol misuse found that residents had fewer contacts with emergency medical services in the 2 years after move-in, compared with the 2 years prior [16].

Providing housing to homeless persons in and of itself is a health intervention. Once the basic survival needs associated with stable housing are met, individuals are able to focus on meeting other needs [26]. These may include needs such as accessing preventive health care treatment, receiving medical treatment in a nonemergency setting for comorbid conditions, and seeking treatment for a SUD. NYNY III not only provided housing, the program also helped connect tenants to care. In this study, the fact that we observed lower rates of alcohol- and drug-related ED visits and hospitalizations among placed persons may in part be explained by the higher proportion who received SUD treatment care in this group. Many of these outpatient treatment visits may have been facilitated through housing case managers or other staff. However, although NYNY III

provided services to improve access to care, residents were not required to seek or accept care. All the individuals placed into housing in this analysis were placed with programs where housing was not contingent on abstinence from alcohol or drug use, similar to the "Housing First" model [27]. Therefore, these reductions in substance use health care visits occurred in a context where both placed and unplaced individuals may have continued to use or lived with persons who used drugs and alcohol, and where both groups may not have accessed supportive services, which suggests that housing itself had an impact on emergency health care utilization. Other studies have found that Housing First programs are associated with housing retention, decreases in substance use, and reduced ED costs [27,28].

Our study identified alcohol-related disorders as being the leading principal diagnosis of substance use–related ED visits and hospitalizations. This result aligns with the high proportion of our cohort who reported alcohol use and mirrors the findings of a multistate study which showed that alcohol-related disorders comprise the majority of substance use hospitalizations [29]. Complementing supportive housing initiatives with evidence-based public health policies and interventions such as Screening, Brief Intervention, and Referral to Treatment programs may help to reduce excessive alcohol consumption, which may thereby further reduce the number of hospitalizations and ED visits [30].

One limitation of this analysis is that we observed significant differences in Medicaid-eligible days during the follow-up period by housing status, although we accounted for this by incorporating this variable into our rate calculation. In addition, while we aimed to adjust for inherent differences between placed and unplaced persons using IPTW and doubly robust models, there may be unmeasured differences that we were unable to account for. This analysis only captured formal outpatient SUD treatment and therefore may be missing referrals to services that do not bill Medicaid, such as Alcoholics Anonymous or Narcotics Anonymous group meetings and alternative medicine. Another limitation is that, although our SUD process of care outcomes is based on validated, process-based measures, they may not correctly capture persons prescribed buprenorphine, as this treatment frequently only requires one visit every 30 days. Therefore, these persons may be successfully engaged in this opioid treatment, but not

Table 3
AORs for substance use outpatient treatment among active substance users eligible for a supportive housing program, 2007–2014*

Supportive housing status	Identified as having new substance use claim		Initiated substance use outpatient treatment within 14 d		Engaged in two or more substance use outpatient treatment visits within 30 d	
	n (%)	AOR (95% CI)	n (%)	AOR (95% CI)	n (%)	AOR (95% CI)
Placed	344 (46.9)	1.78 (1.40–2.27)	291 (84.6)	1.66 (1.01–2.74)	261 (86.7)	1.22 (0.51–2.94)
Unplaced	260 (38.5)	Ref	192 (73.9)	Ref	161 (83.9)	Ref

AOR = adjusted odds ratio.
* See appendix for model covariates.

Table 4
Leading principal diagnoses of substance use—related emergency department visits and hospitalizations among active substance users eligible for a supportive housing program, 2007—2014

Health diagnosis	Placed	Unplaced	P
	n (%)	n (%)	
Emergency department visits			
Total	856	2589	
Nondependent alcohol abuse	507 (59.2)	1683 (65.0)	.0023
Alcohol dependence	206 (24.1)	708 (27.4)	.0594
Opioid dependence	45 (5.3)	37 (1.4)	<.0001
Nondependent other drug type or unspecified drug abuse	29 (3.4)	42 (1.6)	.0016
Drug-induced mental disorder	*	25 (1.0)	.9356
Nondependent opioid abuse	21 (2.5)	*	<.0001
Alcohol-induced mental disorder	*	22 (0.9)	.1357
Hospitalizations			
Total	697	1216	
Alcohol dependence	358 (51.4)	633 (52.1)	.7704
Alcohol-induced mental disorder	110 (15.8)	245 (20.2)	.0181
Drug-induced mental disorder	47 (6.7)	86 (7.1)	.7853
Opioid dependence	35 (5.0)	74 (6.1)	.3340
Cocaine dependence	47 (6.7)	37 (3.0)	.0001
Combination drug dependence (not including opioids)	18 (2.6)	41 (3.4)	.3366
Sedative dependence	20 (2.9)	32 (2.6)	.7582
Alcoholic cirrhosis of the liver	*	16 (1.3)	.2267

* Suppressed due to low numbers; only the most common diagnosis categories are included.

categorized as such. We also lacked data on the length of time an individual was homeless beyond the fact that they met the program's minimum criterion. Also, these findings may not be generalizable to other NYNY III subpopulations, although they may be generalizable to persons experiencing homelessness who use drugs or alcohol in other urban communities, particularly those with similar substance use profiles and connections to care and other resources. Finally, we lacked data on alcohol and drug use during the follow-up period.

One strength of this study is that we were able to measure objective endpoints using matched administrative data. We were also able to account for healthcare utilization 2 years before the study period, which we adjusted for in our IPTW analysis. Finally, we conducted a sensitivity analysis that removed the outliers, which yielded similar results to our main findings.

Conclusion

Providing persons experiencing both homelessness and a SUD with supportive housing can lead to a reduction in alcohol- and drug-related hospitalizations and ED visits and an increase in SUD-related outpatient treatment visits. Our results add to the increasing body of evidence which shows that supportive housing programs yield improved health outcomes and should be continued or expanded to other communities.

Acknowledgments

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Appendix

Appendix
Standardized differences for model covariates between placed and unplaced groups eligible for a supportive housing program, before and after stabilized inverse probability of treatment weighting 2007–2014

Characteristic	Standardized differences	
	Unweighted sample	Weighted sample
Male	0.079	−0.100
Mean age	0.051	0.009
Race and ethnicity		
White non-Latino	−0.201	0.003
Black non-Latino	0.145	0.097
Latino	0.038	−0.101
Asian	−0.080	−0.042
Other race or ethnicity	−0.067	−0.022
Language		
English	0.028	0.015
Spanish	−0.007	−0.046
Education		
Less than high school	0.026	−0.008
High school diploma or higher	−0.018	0.030
Other	−0.023	−0.059
Veteran	−0.062	−0.035
Current substance use pattern		
Less than weekly	0.010	−0.036
Once a week	0.115	−0.033
Several times per week	−0.008	−0.038
Daily	0.060	−0.059
Unknown	−0.052	0.045
Past substance use pattern		
Less than weekly	−0.002	−0.005
Once a week	−0.058	−0.058
Several times per week	−0.081	−0.079
Daily	0.134	−0.066
Unknown	−0.038	−0.010
Completed or participated in substance use treatment	−0.039	0.121
Currently incarcerated, hospitalized, in foster care or in some other type of institution	−0.063	−0.006
Past psychiatric hospitalization	−0.027	0.248
Currently receiving		
Social security	−0.056	−0.036
Medicare	0.054	−0.002
Supplemental security income or disability	−0.117	0.097
Veteran's benefits	−0.137	−0.047
Pension	0.045	0.009
HIV/AIDS Services Administration services	−0.401	−0.245
Any mental illness	−0.107	0.106
Intellectual disability	−0.013	−0.035
Any mental illness other than intellectual disability or substance use disorder	−0.176	0.101
Physical health diagnosis	0.056	−0.005
Severe physical health diagnosis	−0.035	0.047
Comorbidity of mental and physical diagnosis	0.018	0.041
Comorbidity of mental and severe physical diagnosis	−0.052	0.043
Number of daily tasks requiring assistance (including walking and climbing stairs; travel; hearing; vision; personal hygiene; toileting; feeding and meal preparation; housekeeping; managing finances; cognitive functions)		
0	0.094	−0.037
1	−0.006	0.069
2	−0.093	−0.030
4–10	−0.087	−0.005
Number of mental health symptoms (history)		
0	0.235	−0.088
1	−0.100	−0.039
2–6	−0.209	0.160

Appendix (continued)

Characteristic	Standardized differences	
	Unweighted sample	Weighted sample
Number of violence-related symptoms or behaviors (history)		
0	−0.116	0.029
1	0.007	−0.123
2–5	−0.152	0.073
Number of mental health symptoms (current)		
0	0.156	0.016
1	−0.078	0.012
2–6	−0.180	−0.066
Number of violence-related symptoms or behaviors (current)		
0	0.000	<0.001
1	−0.067	0.039
2–5	0.052	0.038
Approved for scatter site housing	0.333	−0.231
Approved for congregate housing	0.121	0.026
Eligibility date		
January 1, 2017 to June 30, 2008	0.175	0.013
July 1, 2008 to December 31, 2008	0.452	−0.015
January 1, 2009 to June 30, 2009	0.066	0.068
July 1, 2009 to December 31, 2009	−0.105	−0.049
January 1, 2010 to June 30, 2010	−0.278	0.048
July 1, 2010 to December 31, 2010	0.026	−0.010
January 1, 2011 to June 30, 2011	−0.060	−0.044
July 30, 2011 to December 31, 2011	−0.119	−0.032
January 1, 2012 to June 30, 2012	−0.213	−0.150
July 1, 2012 to December 31, 2012	−0.050	0.290
Recommended services		
Primary healthcare services	−0.039	−0.136
Financial management services	0.218	0.095
Job or vocational training	0.235	0.080
Substance use program	0.168	−0.020
Medication management	−0.260	0.170
Medical treatment	0.031	−0.038
Mentally Ill Chemical Abuse treatment program	−0.350	0.279
Ongoing psychiatric treatment	0.110	0.171
Case management	0.058	0.120
Mental health or day treatment program	−0.414	0.189
Costs, 2 y pre-eligibility		
Total	−0.300	0.061
Singles shelter use	0.108	0.086
Family shelter use	−0.106	−0.026
Incarceration	−0.139	0.098
Food stamps	−0.126	−0.004
Medicaid outpatient	0.134	0.059
Medicaid inpatient	−0.193	−0.028
Medicaid emergency department	−0.218	0.000
Medicaid prescriptions	−0.265	0.214
Medicaid other	−0.218	−0.003