

# "Housing First" for Homeless Youth With Mental Illness

Nicole Kozloff, MD,<sup>a,b</sup> Carol E. Adair, PhD,<sup>c,d</sup> Luis I. Palma Lazgare, MSc,<sup>a</sup> Daniel Poremski, PhD,<sup>a</sup> Amy H. Cheung, MD, MSc,<sup>b,e</sup> Rebeca Sandu, MSc,<sup>f</sup> Vicky Stergiopoulos, MD, MHS<sup>a,b,g</sup>

abstract

**BACKGROUND AND OBJECTIVES:** "Housing First" has been shown to improve housing stability in homeless individuals with mental illness, but had not been empirically tested in homeless youth. We aimed to evaluate the effect of "Housing First" on housing stability in homeless youth aged 18 to 24 years participating in At Home/Chez Soi, a 24-month randomized trial of "Housing First" in 5 Canadian cities.

**METHODS:** Homeless individuals with mental illness were randomized to receive "Housing First" (combined with assertive community treatment or intensive case management depending on their level of need) or treatment as usual. We defined our primary outcome, housing stability, as the percent of days stably housed as a proportion of days for which residence data were available.

**RESULTS:** Of 2148 participants who completed baseline interviews and were randomized, 7% ( $n = 156$ ) were youth aged 18 to 24 years; 87 received "Housing First" and 69 received treatment as usual. In an adjusted analysis, youth in "Housing First" were stably housed a mean of 437 of 645 (65%) days for which data were available compared with youth in treatment as usual, who were stably housed a mean of 189 of 582 (31%) days for which data were available, resulting in an adjusted mean difference of 34% (95% confidence interval, 24%–45%;  $P < .001$ ).

**CONCLUSIONS:** "Housing First" was associated with improved housing stability in homeless youth with mental illness. Future research should explore whether adaptations of the model for youth yield additional improvements in housing stability and other outcomes.



<sup>a</sup>Centre for Urban Health Solutions, Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, Ontario, Canada; <sup>b</sup>Department of Psychiatry, University of Toronto, Toronto, Ontario, Canada; <sup>c</sup>Departments of <sup>c</sup>Psychiatry and <sup>d</sup>Community Health Sciences, University of Calgary, Calgary, Alberta, Canada; <sup>e</sup>Department of Psychiatry, Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada; <sup>f</sup>Dartington Social Research Unit, Dartington, Totnes, United Kingdom; and <sup>g</sup>Centre for Addiction and Mental Health, Toronto, Ontario, Canada

Dr Kozloff guided the conceptualization of the analysis, selection of variables, and interpretation of findings, drafted the manuscript, and made substantive edits to the draft; Dr Adair was a member of the National Research Team and contributed to all aspects, including the design, implementation, analysis, and interpretation of the findings of the original trial, and was involved in the conceptualization of the analysis, the selection of variables, interpretation of findings, and providing feedback on the current manuscript; Mr Palma Lazgare contributed to the conceptualization and selection of variables and led the analysis of the current study and provided feedback on the manuscript; Drs Poremski and Cheung and Ms Sandu were involved in the conceptualization of the analysis, the selection of variables, interpretation of findings, and providing feedback on the current manuscript; Dr Stergiopoulos was a site coprincipal investigator and member of the National Research Team and therefore contributed to the design, implementation, analysis, and interpretation of the findings of the original trial, and she guided the conceptualization of the current study and the analysis and provided extensive feedback on the manuscript; and all authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

**WHAT'S KNOWN ON THIS SUBJECT:** Despite the burden of homelessness on young people, there is little evidence for interventions targeting their housing. "Housing First," a housing and psychosocial intervention with evidence in adults, is being used in youth without having been tested in this population.

**WHAT THIS STUDY ADDS:** This subgroup analysis of youth aged 18 to 24 years provides experimental evidence that "Housing First" in homeless youth with mental illness improves housing stability relative to usual care. Adaptations of the model may be required to improve other outcomes.

**To cite:** Kozloff N, Adair CE, Palma Lazgare LI, et al. "Housing First" for Homeless Youth With Mental Illness. *Pediatrics*. 2016;138(4):e20161514

Ten percent of America's homeless are unaccompanied youth aged 18 to 24 years.<sup>1</sup> Homeless youth have rates of mental disorders at least twice those of housed youth.<sup>2</sup> On average, homeless youth with mental illness report having been homeless for over 2 years, a substantial portion of their young lives.<sup>3</sup> The chronic stress and deprivation associated with homelessness may have lasting effects on cognitive and academic functioning, financial stability, and physical and mental health.<sup>2</sup>

Despite this, few interventions for homeless youth have been empirically tested,<sup>2,4</sup> and even fewer have targeted housing outcomes. Case management, a strategy used widely with homeless youth, has demonstrated improvements in housing stability over time, but did not separate from other active treatments<sup>5</sup> or treatment as usual.<sup>6</sup> The Community Reinforcement Approach, an operant-based behavior therapy tested in 2 randomized controlled trials in homeless youth, was associated with a reduction of days homeless<sup>5</sup> and increased social stability (a measure which included housing),<sup>7</sup> but with only the latter trial demonstrating improvement relative to a comparison group, it is not clear that any empirically tested interventions have impacted youth's housing stability beyond general support and the passage of time.

"Housing First," developed in New York in the 1990s by Pathways to Housing based on the principles of housing as a human right, harm reduction, consumer choice, and recovery, provides immediate access to permanent independent housing in the community.<sup>8</sup> In homeless adults with mental illness, it has been consistently shown to increase housing stability, and some studies have also found improvements in other outcomes, including days in the hospital, quality of life, and substance use.<sup>9</sup> In 2008, the Canadian government invested \$110

million through the Mental Health Commission of Canada for At Home/Chez Soi, the largest trial of "Housing First" to date. At Home/Chez Soi found that "Housing First" improved housing stability in homeless people with mental illness<sup>10,11</sup>; participants who received more intensive psychosocial support also had improvements in quality of life and community functioning compared with usual care.<sup>11</sup> Paralleling its dissemination in homeless adults, "Housing First" is increasingly being applied to homeless youth; the US Department of Housing and Urban Development presents models based on "Housing First" principles as best practice for homeless youth.<sup>12</sup> However, "Housing First" has never been experimentally tested in youth, including as a subgroup in previous trials. Given the importance of establishing evidence to improve housing in youth, we conducted a subgroup analysis of youth aged 18 to 24 years in At Home/Chez Soi. Our objectives were to examine the impact of "Housing First" on housing stability in homeless youth, to compare this with the effect in adults, and, guided by findings in adults,<sup>9</sup> to explore the effect of "Housing First" on other domains, including quality of life, community functioning, psychological distress, problem substance use, health services use, and arrests in homeless youth.

## METHODS

### Study Design

At Home/Chez Soi was a randomized controlled trial of "Housing First" across 5 cities in Canada: Vancouver, Winnipeg, Toronto, Montreal, and Moncton. The study protocol has been detailed elsewhere.<sup>13</sup> Study recruitment occurred from October 2009 through June 2011. Research ethics boards in each jurisdiction approved the study (11 in total).

Participants were stratified into high- or moderate-needs groups

according to their clinical and service use characteristics; high-needs participants were assigned to receive assertive community treatment (ACT) or treatment as usual and moderate-needs participants were assigned to receive intensive case management (ICM) (with some participants also receiving a locally developed psychosocial intervention) or treatment as usual (Supplemental Table 3). This subgroup analysis combined active treatment groups to compare participants assigned to "Housing First" plus ACT or ICM with those who received treatment as usual. The 2-year outcomes associated with "Housing First" plus ACT and "Housing First" plus ICM in the full sample have been reported separately.<sup>10,11</sup>

### Participants

Participants were currently homeless or precariously housed individuals  $\geq 18$  years in Moncton, Montreal, Toronto, and Winnipeg and  $\geq 19$  years in Vancouver with a mental disorder. Homeless was defined as no fixed place to stay for  $\geq 7$  nights and little likelihood of obtaining permanent housing in the coming month, and precariously housed was defined as living in a rooming house, single-room occupancy or hotel/motel with  $\geq 2$  episodes of homelessness in the past year. Diagnosis of a mental disorder was based on *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* criteria determined by the Mini International Neuropsychiatric Interview administered by researchers under supervision of a clinical psychologist, or written diagnosis (current psychiatric discharge summary or consultation report) at study entry.<sup>14</sup> Individuals were excluded if they were already clients of ACT or ICM teams, had illegal immigration status, or did not meet specified criteria for homelessness. Participants were recruited from community agencies

that serve homeless people, institutions, including health care facilities and prisons and jails, and directly from the street. Recruitment was targeted at 100 participants per treatment arm per site.

## Study Procedures

Potential participants provided verbal consent for eligibility screening, and then those who met inclusion criteria were assessed for capacity to consent before providing written informed consent. Participants were randomized to the active treatment or usual care by computer by using adaptive randomization procedures in a 1:1 allocation ratio. The nature of the project did not allow for blinding of participants or interviewers.

Participants assigned to "Housing First" were given access to scattered-site housing of their choice with mobile, off-site mental health services.<sup>8</sup> They were required to have weekly contact with a mental health worker, but were not mandated to achieve or maintain sobriety or accept psychiatric treatment. Participants assigned to usual care had access to housing and support services through other programs in their communities postrandomization, including other ACT or ICM programs. None of the study cities offered the Pathways "Housing First" model before this study.

Participants completed comprehensive in-person interviews at baseline and every 6 months and brief measures of housing and vocational status by telephone or in person approximately every 3 months with procedures in place to maximize participant retention and data quality.<sup>13</sup> Most participants were followed for 24 months, although those enrolled toward the end of the trial were only followed for 21 months. If interviewers indicated "no confidence" in participant responses, these were treated as

missing (accounting for <2% of youth responses). Data were entered remotely on laptops and stored in a central database. Participants received cash incentives for attending interviews ranging from \$30 to \$50 depending on the site and interview duration. This trial is registered with the International Standard Randomized Control Trial Register (identifier ISRCTN42520374).

## Outcomes

The predefined primary outcome for the trial and this subgroup analysis was housing stability, measured with the highly reliable and valid Residential Time-Line Follow-Back Inventory, defined as days stably housed as a proportion of the number of days for which any type of residence data were available over the preceding 6 months.<sup>15</sup> The main trial's secondary outcome was generic quality of life, measured using EuroQoL 5 Dimensions, a standardized health utility and visual analog scale, which is used widely in clinical and economic evaluations.<sup>16</sup>

As exploratory outcomes, we examined condition-specific quality of life with the Lehman Quality of Life Interview 20 (QOLI-20) index,<sup>17</sup> community functioning with the observer-rated Multnomah Community Ability Scale,<sup>18</sup> community integration with the psychological integration subscale of the Community Integration Scale,<sup>19</sup> recovery with the Recovery Assessment Scale,<sup>20</sup> self-rated physical health and mental health symptoms with the physical component summary and mental component summary scores of the Short Form 12 survey,<sup>21</sup> past-month mental health symptoms with the Colorado Symptom Index,<sup>22</sup> and past-month substance-related problems with the Global Assessment of Individual Needs Short Screener—Substance Problem Scale.<sup>23</sup> The Health, Social and Justice Service Use Inventory, developed for the study

based on existing measures, assessed health and criminal justice service involvement over the past 6 months: number of emergency department visits, having a regular medical doctor, perceived unmet health care needs, and number of arrests. Service provider visits were self-reported in the past month. Victimization was assessed by using questions from Statistics Canada's General Social Survey, capturing participants who reported having been robbed by force, hit or attacked, or attempted forced or forced sexual activity in the last 6 months.<sup>24</sup> Employment was measured by using the Vocational Time-Line Follow-Back Inventory.<sup>25</sup>

All outcomes were assessed at baseline. Housing and employment were assessed every 3 months. The remaining outcomes were assessed every 6 months, with the exception of the Short Form-12 (baseline, 12 months, and 24 months), and Recovery Assessment Scale (baseline and 24 months).

## Statistical Methods

Power was not determined a priori for this subgroup analysis of youth, but we calculated that a minimum of 63 participants per group would provide 80% power to detect an effect size of 0.5 for our outcomes, assuming homogeneity across sites and no attrition. We defined youth as  $\leq 24$  years old, reflective of the definitions used by the United Nations (which defines youth as 15–24 years) and local governments (most of which define homeless youth as 16–24 years), although we were limited by the original study design to include only people  $\geq 18$  years old.

We analyzed the effect of the intervention in youth on the percent of days stably housed over each 6-month time point by fitting an analysis of covariance model that included treatment assignment, study city, indicators of ethnorracial and Aboriginal status, and a treatment  $\times$

site interaction. We used a repeated measures mixed-effects model to determine the mean difference in housing stability in the "Housing First" and treatment as usual groups between youth  $\leq 24$  years and older participants over time by fitting a model with a 3-way interaction (treatment  $\times$  age group  $\times$  time). Minimal data on housing stability were missing in the full sample (in the range of 4%).<sup>10,11</sup>

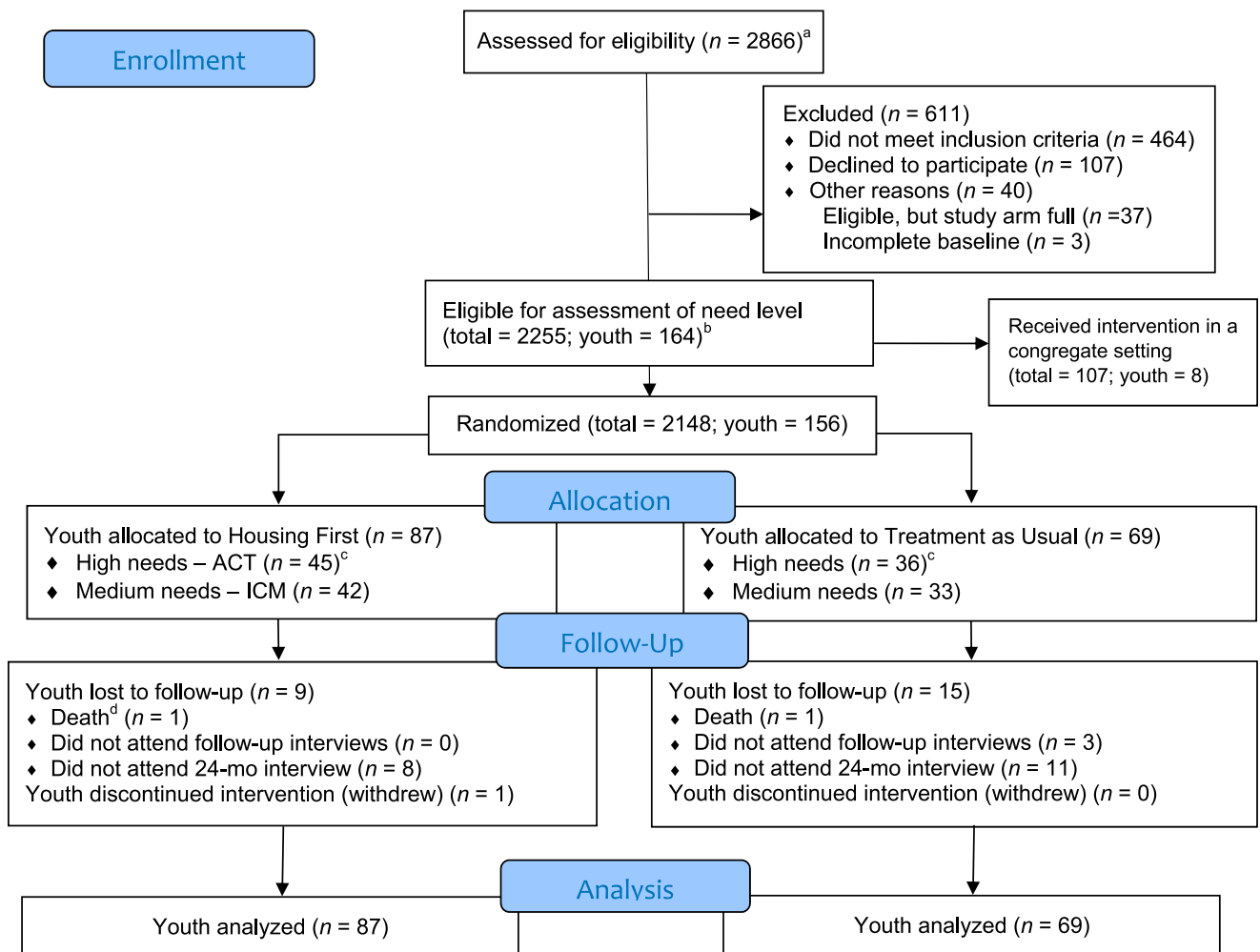
For analysis of quality of life and exploratory outcomes, we applied a linear mixed models framework to perform repeated measures

analysis of longitudinal continuous outcomes. We applied generalized estimating equations to repeated counts assuming the negative binomial distribution when outcomes were overdispersed. We calculated model-estimated differences in mean changes from baseline for continuous outcomes and ratio of rate ratios for counts and ratio of odds ratios for binary outcomes at the 6-, 12-, 18-, and 24-month time points with 95% confidence intervals (CIs). We assessed employment over the 24-month study period. We tested the main fixed effects of treatment group, time, study city, and

Aboriginal or ethnoracial status, as well as the overall treatment  $\times$  time interaction. Because outcomes in our subgroup analysis were exploratory in nature, significance level was maintained at  $\alpha = .05$  and not adjusted for multiple testing. We conducted our analyses by using SAS, version 9.4 (SAS Institute, Inc, Cary, NC).

## RESULTS

Of 2148 participants who were included in these analyses, 7% ( $n = 156$ ) were youth: 87 randomized to "Housing First" (either ACT or



**FIGURE 1**

Flow of participants through the study. <sup>a</sup> The number of participants assessed for eligibility is an estimate because some sites used prescreening and did not document those who were excluded through this process; we do not have sufficient information to present this data by age group. <sup>b</sup> "Youth" indicates participants aged 18 to 24 years who are highlighted in the subgroup analysis presented in this paper. <sup>c</sup> One site randomized all active participants to ACT. <sup>d</sup> Counts of participants withdrawn due to death may be underestimates. Vital statistics data have been requested and these figures may change in the future.

ICM) and 69 to treatment as usual (see Fig 1). Baseline characteristics are displayed in Table 1. Although participants had not been explicitly randomized according to age, the youth treatment and control groups were balanced in their distribution of covariates.

In an analysis adjusting for study city and ethnoracial and Aboriginal status, youth in "Housing First" were stably housed a mean of 437 of 645 (65%) days for which data were available compared with youth in treatment as usual, who were stably housed a mean of 189 of 582 (31%) days for which data were available, resulting in an adjusted mean difference of 34% (95% CI, 24%–45%;  $P < .001$ ).

Figure 2 presents a comparison of youth aged 18 to 24 years and adults aged >24 years on mean percentage of days stably housed. The overall effect of the 3-way interaction of treatment group, age (18–24 years vs >24 years), and time on housing stability was nonsignificant ( $P = .59$ ). For example, the difference in mean change in housing stability from 3 months to 24 months for 18- to 24-year-olds compared with >24-year-olds was –4% (95% CI, –19% to 12%;  $P = .62$ ).

Table 2 presents the trial's secondary outcome (generic quality of life) and exploratory outcomes in youth ≤24 years old. "Housing First" was associated with significant improvements in leisure, a category of the QOLI-20, at 6, 12, and 24 months, and an improvement in the total condition-specific quality of life score at 6 months relative to usual care. However, these improvements in leisure and the total QOLI-20 score did not result in significant differences from treatment as usual in the overall treatment group × time analysis ( $P = .10$  and  $P = .17$ , respectively). "Housing First" was associated with lower rates of employment over the

24-month study; 27 (32%) youths who received "Housing First" had at least 1 period of employment compared with 28 (44%) youths who received usual care, resulting in an adjusted odds ratio of 0.48 (95% CI, 0.24–0.99;  $P = .05$ ). We did not find significant differences between "Housing First" and treatment as usual for other exploratory outcomes.

## DISCUSSION

In the first experimental study of "Housing First" for homeless youth with mental illness, "Housing First" significantly improved housing stability. This effect was not significantly different from the effect

in older adults and was consistent with findings from previous studies of "Housing First" in adults,<sup>9</sup> as well as a case study that demonstrated high rates of housing retention in youth who received "Housing First".<sup>26</sup>

"Housing First" plus ICM or ACT did not appear to have a statistically significant effect on other outcomes in our youth sample. This is consistent with findings from the larger At Home/Chez Soi trial,<sup>10</sup> in which "Housing First" plus ICM improved housing stability in moderate-needs participants, but for other outcomes did not separate from usual care. "Housing First" plus ACT also improved housing stability and resulted in small but statistically

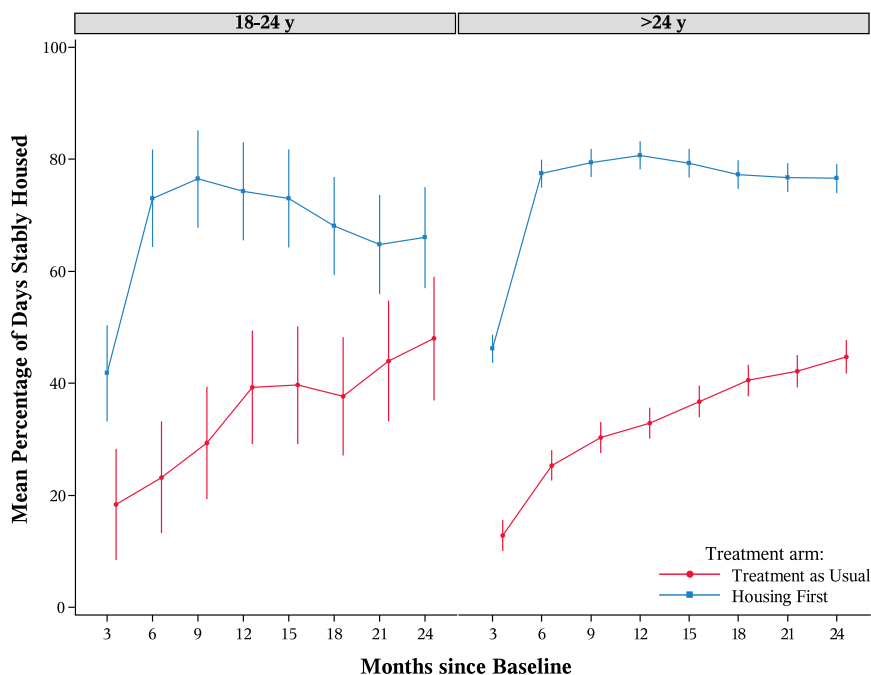
**TABLE 1** Baseline Characteristics of Youth Aged 18 to 24 y in At Home/Chez Soi

Characteristic	"Housing First" (n = 87) <sup>a</sup>	Treatment As Usual (n = 69) <sup>a</sup>
Age, y	21.5 (1.4)	21.6 (1.6)
Non-male gender <sup>b</sup>	38 (44%)	23 (33%)
Racial, ethnic, or cultural identity		
Aboriginal	19 (22%)	22 (32%)
Ethnoracial	32 (37%)	23 (33%)
White	36 (41%)	24 (35%)
Born outside Canada	14 (16%)	11 (16%)
Current housing status		
Absolutely homeless	73 (84%)	62 (90%)
Precariously housed	14 (16%)	7 (10%)
Age first homeless, y	17.8 (3.3)	18.4 (3.0)
Lifetime duration homeless, y	2.3 (2.3)	1.9 (1.8)
Median (IQR)	1.5 (0.7–3.4)	1.0 (0.5–3.0)
Education		
Did not complete high school	69 (79%)	49 (71%)
Completed high school only	10 (11%)	14 (20%)
Some postsecondary school	8 (9%)	6 (9%)
Median income, Canadian dollars	393.50 (130.00–725.00)	301.50 (123.00–599.50)
Mental disorder (current)		
Major depressive episode	43 (49%)	37 (54%)
Manic or hypomanic episode	17 (20%)	16 (23%)
Posttraumatic stress disorder	30 (34%)	25 (36%)
Panic disorder	19 (22%)	9 (13%)
Mood disorder with psychotic features	13 (15%)	12 (17%)
Psychotic disorder	27 (31%)	17 (25%)
Drug use disorder	56 (64%)	45 (65%)
Alcohol use disorder	41 (47%)	39 (56%)
Suicidality		
Moderate/high	35 (40%)	28 (41%)
No/low	52 (60%)	41 (59%)
MCAS	60.1 (6.8)	59.5 (7.6)

IQR, interquartile range; MCAS, Multnomah Community Ability Scale: possible scores range from 17 to 85, with higher scores indicating a higher level of community functioning.

<sup>a</sup> Data are n (%) or mean (SD).

<sup>b</sup> Gender was self-reported as male, female, transgender, transsexual, other, or declined to answer. "Female" was combined with all responses other than male for privacy reasons due to small numbers.



**FIGURE 2** Comparison of youth aged 18 to 24 years and adults aged >24 years on mean percentage of days stably housed.

significant improvements in quality of life and community functioning relative to treatment as usual, but there were no other differences.<sup>11</sup>

There are several potential explanations for our findings that "Housing First" only improved housing stability in homeless youth with mental illness. First, the sample size of youth aged 18 to 24 years was not determined a priori, and the study may have been underpowered to detect between-group differences. Second, combining ACT and ICM recipients may have obscured differences in outcomes by level of need. As noted above, analyses of the larger sample suggested that high-needs participants receiving the more intensive ACT intervention showed improvements in additional domains, but our sample size did not allow us to examine outcomes by intervention type.<sup>11</sup> Third, participants in both the intervention and control groups may have exhibited regression to the mean on these outcomes. Those receiving usual care had access to other

psychosocial services, which, perhaps for youth especially, may be fairly comprehensive, thus decreasing between-group differences. We found that "Housing First" and usual care recipients did not significantly differ in their service contacts. Fourth, our follow-up period may have been long enough to capture differences in housing outcomes, but not some of the secondary benefits that may occur as a result of stable housing. Based on earlier work, we know that our youngest participants had been homeless for years, with high rates of childhood trauma, chronic conditions like traumatic brain injury, and ongoing victimization, and therefore may take time after their housing is stabilized to recover in other areas and shift their use of acute medical services.<sup>3</sup> Lastly, although ICM and ACT teams were regularly evaluated for model fidelity, the psychosocial interventions delivered may have varied across sites or service providers, or may not have been as well-suited to youth. Although the current "Housing First"

plus ACT or ICM model improved housing stability in homeless youth, adaptations may be needed to target other outcomes. A detailed comparison of youth and adults in this sample suggested that youth were more likely to be an ethnoracial minority, have not completed high school, have a learning disorder or a drug use disorder, and to have been arrested recently, and were less likely to have a regular medical doctor, all of which may warrant tailored approaches to serving them.<sup>3</sup>

One exploratory outcome that did show some responsiveness to "Housing First" was satisfaction with leisure activities. This echoes the idea in Mullainathan and Shafir's *Scarcity* that great stress diminishes the ability to engage in other tasks.<sup>27</sup> Restoring housing stability might allow young people to enjoy leisure activities even if it does not result in a measurable impact on other areas of functioning. Youth who received "Housing First" were less likely to have worked than those who received usual care. This is consistent with findings from the larger At Home/ Chez Soi trial, which showed that "Housing First" recipients had lower odds of obtaining competitive employment compared with those who received treatment as usual.<sup>28</sup> The authors hypothesized that receiving rent subsidies and government benefits may have reduced the financial burden of unemployment and decreased the incentive to work, particularly in provinces with lower earning exemptions for people receiving benefits (where participants had even lower odds of obtaining employment). We only examined a crude measure of employment in youth, but not the suitability or duration of employment. Additional research is needed to better understand pathways to meaningful

**TABLE 2** Secondary and Exploratory Outcomes of "Housing First" Compared With Treatment as Usual in Youth Aged 18 to 24 y

Outcomes	Treatment Effect								
	6 mo		12 mo		18 mo		24 mo		Overall Treatment Group × Time Interaction <sup>a</sup>
	Difference or Ratio of Changes From Baseline (95% CI) <sup>b</sup>	<i>P</i>	Difference or Ratio of Changes From Baseline (95% CI)	<i>P</i>	Difference or Ratio of Changes From Baseline (95% CI)	<i>P</i>	Difference or Ratio of Changes From Baseline (95% CI)	<i>P</i>	<i>P</i>
EQ-5D	−1.65 (−11.30 to 8.01)	.74	−7.13 (−17.23 to 2.97)	.17	−1.97 (−13.44 to 9.50)	.74	2.81 (−6.36 to 11.97)	.55	.36
QOLI-20 total score	9.30 (1.35 to 17.24)	.02	8.71 (−0.11 to 17.53)	.05	5.17 (−4.25 to 14.58)	.28	7.29 (−1.61 to 16.18)	.11	.17
Family	1.40 (−0.79 to 3.60)	.21	0.79 (−1.71 to 3.28)	.53	1.38 (−1.20 to 3.95)	.29	1.85(−0.68 to 4.38)	.15	.58
Finances	1.20 (−0.11 to 2.51)	.07	0.69 (−0.62 to 2.00)	.30	−0.05 (−1.37 to 1.27)	.94	0.55(−0.65 to 1.75)	.37	.41
Leisure	3.07 (0.37 to 5.77)	.03	3.27 (0.56 to 5.98)	.02	2.11 (−0.79 to 5.02)	.15	3.16 (0.48 to 5.83)	.02	.10
Living situation	0.81 (−0.03 to 1.65)	.06	0.21 (−0.64 to 1.06)	.63	0.11 (−0.71 to 0.93)	.78	0.31 (−0.57 to 1.19)	.49	.42
Safety	2.03 (−0.44 to 4.51)	.11	1.86 (−0.64 to 4.36)	.14	−0.66 (−3.23 to 1.92)	.61	0.06 (−2.49 to 2.61)	.96	.15
Social	0.81 (−0.94 to 2.56)	.36	1.12 (−0.57 to 2.82)	.19	0.73 (−1.07 to 2.54)	.42	0.98 (−0.63 to 2.59)	.23	.71
Overall quality of life	−0.17 (−0.79 to 0.46)	.60	0.14 (−0.47 to 0.75)	.65	−0.05 (−0.78 to 0.67)	.88	0.10 (−0.53 to 0.72)	.76	.88
MCAS	1.70 (−1.27 to 4.67)	.26	−0.32 (−3.42 to 2.78)	.84	1.82 (−1.63 to 5.28)	.30	0.25 (−2.79 to 3.28)	.87	.49
CIS	0.54 (−0.96 to 2.04)	.48	−0.29 (−1.90 to 1.33)	.73	0.25 (−1.33 to 1.84)	.75	0.49 (−0.99 to 1.98)	.51	.84
RAS							1.80 (−3.33 to 6.93)	.49	.49
SF-12 Physical Health			−1.04 (−5.27 to 3.19)	.63			1.46 (−2.83 to 5.74)	.50	.51
SF-12 Mental Health			−2.60 (−7.75 to 2.55)	.32			−0.78 (−6.74 to 5.18)	.80	.59
CSI	0.3 (−4.00 to 4.59)	.89	0.25 (−4.44 to 4.95)	.92	2.05 (−2.43 to 6.54)	.37	−0.05 (−5.10 to 5.00)	.98	.84
GAIN-SPS	1.18 (0.85 to 1.66)	.33	0.92 (0.60 to 1.41)	.71	1.06 (0.65 to 1.72)	.83	0.84 (0.51 to 1.38)	.49	.55
Victim of violent robbery, physical, or sexual assault, %	0.86 (0.35 to 2.12)	.74	0.75 (0.28 to 2.00)	.57	2.55 (0.87 to 7.46)	.09	1.40 (0.55 to 3.57)	.48	.14
No. of ED visits, count	0.65 (0.31 to 1.39)	.27	1.61 (0.78 to 3.32)	.20	1.46 (0.71 to 2.98)	.30	0.81 (0.39 to 1.70)	.58	.16
Has a regular medical doctor, %	2.08 (0.94 to 4.58)	.07	1.08 (0.51 to 2.27)	.84	0.68 (0.26 to 1.79)	.43	1.75 (0.70 to 4.40)	.23	.09
Perceived unmet health care need, %	1.05 (0.39 to 2.85)	.93	3.31 (1.13 to 9.70)	.03	0.77 (0.25 to 2.43)	.66	0.81 (0.28 to 2.32)	.69	.15
Visited medical service provider, %	1.32 (0.54 to 3.22)	.55	0.89 (0.35 to 2.23)	.81	1.60 (0.56 to 4.55)	.38	1.08 (0.40 to 2.94)	.88	.75
Visited other clinical service provider, %	0.80 (0.29 to 2.19)	.66	0.98 (0.34 to 2.80)	.97	1.38 (0.51 to 3.76)	.53	0.80 (0.28 to 2.27)	.68	.81
Visited social service provider, %	0.53 (0.17 to 1.61)	.26	0.47 (0.15 to 1.47)	.19	0.31 (0.10 to 0.97)	.04	0.77 (0.25 to 2.40)	.65	.26
No. of arrests, count	0.86 (0.26 to 2.89)	.81	1.15 (0.38 to 3.47)	.81	2.27 (0.73 to 7.06)	.16	0.67 (0.22 to 2.07)	.49	.39

CIS, Community Integration Scale psychological integration subscale with possible scores ranging from 4 to 20 (higher scores indicate higher level of integration); CSI, Colorado Symptom Index, a measure of psychiatric symptomatology with possible scores ranging from 5 to 70 (higher scores indicate more severe mental health symptoms); ED, emergency department; EQ-5D, EuroQoL5 Dimensions Visual Analog Scale, a measure of generic quality of life scored from 0 (worst imaginable health state) to 100 (best imaginable health state); GAIN-SPS, Global Assessment of Individual Needs Short Screener—Substance Problem Scale, a measure of substance use problems over the previous month, with possible scores ranging from 0 to 5 (higher scores indicate more symptoms of substance misuse); MCAS, Multnomah Community Ability Scale, a measure of community functioning with possible scores range from 17 to 85 (higher scores indicate a higher level of community functioning); QOLI-20, a measure of condition-specific quality of life with total possible scores ranging from 20 to 140 and subscale scores ranging as follows: family (4–28), finances (2–14), leisure (5–35), living situation (1–7), safety (4–28), social (3–21), and overall quality of life (1–7), with higher scores indicating higher quality of life; RAS, Recovery Assessment Scale, a measure reflecting various components of recovery with possible scores ranging from 22 to 110 (higher scores indicate higher degree of recovery); SF-12, Short Form 12 survey, a measure of physical and mental health status assessed by the physical component summary and mental health component summary, both of which range from 0 to 100 (higher scores indicate better health status).

<sup>a</sup> Models included treatment group (reference: treatment as usual), time (month of visit; reference: baseline), study city (reference: Winnipeg), Aboriginal and ethnoracial status (reference: non-Aboriginal/non-ethnoracial), and treatment × time interaction.

<sup>b</sup> Mean difference for continuous variables, ratio of rate ratios for count variables, and ratio of odds ratio for binary data.

employment for homeless youth with mental illness.

The parent study has many strengths, including its randomized controlled design, extensive outcome measures, and delivery in a range of local contexts. However, we acknowledge some limitations in our work. First,

this is a subgroup analysis of a larger study on "Housing First"; the intervention was not adapted to youth, nor were the instruments specifically selected with youth in mind. We were limited by study inclusion criteria to examining homeless youth aged 18 years and older. Although including youth aged

16 to 17 years would have more accurately reflected existing services for homeless youth, differences in legal status for tenancy and, in some jurisdictions, informed consent make "Housing First" more complicated to study and implement in youth <18 years. These findings may not be generalizable to young people

<18 years. We conservatively used 24 years of age as the upper limit for "youth," and the resulting smaller sample may have been underpowered to detect differences in the intervention and control groups. Because of the nature of the study, participants and researchers were not blinded to treatment allocation. Because outcomes were exploratory in nature, we did not correct for multiple comparisons. Although sites were assessed for model fidelity, we could not control for all possible differences in services (eg, access to psychosocial interventions). Most of the outcomes analyzed in this study were based on self-report, including health services use and arrests, which may benefit from corroboration with administrative data.

## CONCLUSIONS

This study has significant implications as the first to present experimental data examining "Housing First" for homeless youth with mental illness. It suggests that "Housing First" is a viable intervention to promote housing stability in homeless youth with mental illness and is as effective for young people as it is for adults in general. This real-world trial

is expected to be reproducible given fidelity to a well-described model that has been replicated internationally.<sup>8</sup> However, given that other outcomes did not appear to respond to the intervention, we suggest considering modifications of "Housing First" to maintain fidelity to core principles while better meeting the needs of youth. This may include attention to issues such as peer/family relationships, sexual health, education and job skills, culture, life skills, substance use, and crime avoidance, and should engage youth in all stages of implementation and evaluation. The results presented here are an important step to developing effective interventions to decrease the long-term consequences of homelessness in youth.

## ACKNOWLEDGMENTS

The authors wish to thank Jayne Barker, PhD (2008–2011), Cameron Keller (2011–2012), and Catharine Hume (2012 to present) (Mental Health Commission of Canada At Home/Chez Soi National Project Leads), the National Research Team, the 5 site research teams, the site coordinators, and the numerous service and housing providers, as well as persons

with lived experience, who have contributed to this project and the research. The above individuals have received compensation from the Mental Health Commission of Canada for their role in the study. The authors wish to dedicate this paper to the memory of Paula Goering, RN, PhD, lead investigator of the At Home/Chez Soi trial, who drove the design, implementation, analysis, and dissemination of the original trial. We thank Dr Goering for her mentorship and for sharing her immense expertise with our research team, guiding our analysis and interpretation, and providing feedback on earlier drafts of this manuscript. We also thank Agnes Gozdzik, PhD, for her assistance and expertise and Amanda Noble, MSW, and Michael Little, PhD, for providing feedback on earlier drafts. The views expressed herein solely represent those of the authors.

## ABBREVIATIONS

ACT: assertive community treatment  
CI: confidence interval  
ICM: intensive case management  
QOLI-20: Lehman Quality of Life Interview 20

---

This trial has been registered with the ISRCTN Register (<http://isrctn.org>) (identifier ISRCTN42520374).

**DOI:** 10.1542/peds.2016-1514

Accepted for publication Jul 25, 2016

Address correspondence to Nicole Kozloff, MD, Centre for Urban Health Solutions, Li Ka Shing Knowledge Institute, St. Michael's Hospital, 30 Bond St, Toronto, ON M5B 1W8, Canada. E-mail: [n.kozloff@mail.utoronto.ca](mailto:n.kozloff@mail.utoronto.ca)

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2016 by the American Academy of Pediatrics

**FINANCIAL DISCLOSURE:** The authors have indicated they have no financial relationships relevant to this article to disclose.

**FUNDING:** This research was made possible through a financial contribution from Health Canada provided to the Mental Health Commission of Canada. Dr Kozloff's work was supported by a postgraduate research award (Faculty of Medicine, University of Toronto), a Canadian Institutes of Health Research fellowship, and a NARSAD Young Investigator award from the Brain & Behavior Research Foundation.

**POTENTIAL CONFLICT OF INTEREST:** The authors have indicated they have no potential conflicts of interest to disclose.

---



## REFERENCES

- Henry M, Cortes A, Shivji A, Buck K; Office of Community Planning and Development, U.S. Department of Housing and Urban Development. The 2014 Annual Homeless Assessment Report (AHAR) to Congress: Part 1: point-in-time estimates of homelessness. Published October 2014. Available at: [www.hudexchange.info/resources/documents/2014-AHAR-Part1.pdf](http://www.hudexchange.info/resources/documents/2014-AHAR-Part1.pdf). Accessed March 18, 2016
- Edidin JP, Ganim Z, Hunter SJ, Karnik NS. The mental and physical health of homeless youth: a literature review. *Child Psychiatry Hum Dev*. 2012;43(3):354–375
- Kozloff N, Stergiopoulos V, Adair CE, et al. The unique needs of homeless youths with mental illness: baseline findings from a Housing First trial [published online ahead of print June 1, 2016]. *Psychiatr Serv*. 10.1176/appi.ps.201500461
- Altena AM, Brilleslijper-Kater SN, Wolf JL. Effective interventions for homeless youth: a systematic review. *Am J Prev Med*. 2010;38(6):637–645
- Slesnick N, Guo X, Brakenhoff B, Bantchevska D. A comparison of three interventions for homeless youth evidencing substance use disorders: results of a randomized clinical trial. *J Subst Abuse Treat*. 2015;54:1–13
- Grace M, Gill PR. Improving outcomes for unemployed and homeless young people: Findings of the YP4 clinical controlled trial of joined up case management. *Aust Soc Work*. 2014;67(3):419–437
- Slesnick N, Prestopnik JL, Meyers RJ, Glassman M. Treatment outcome for street-living, homeless youth. *Addict Behav*. 2007;32(6):1237–1251
- Tsemberis S. *Housing First Manual: The Pathways Model to End Homelessness for People with Mental Illness and Addiction*. Center City, MN: Hazelden; 2010
- Aubry T, Nelson G, Tsemberis S. Housing First for people with severe mental illness who are homeless: a review of the research and findings from the At Home-Chez Soi demonstration project. *Can J Psychiatry*. 2015;60(11):467–474
- Stergiopoulos V, Hwang SW, Gozdzik A, et al; At Home/Chez Soi Investigators. Effect of scattered-site housing using rent supplements and intensive case management on housing stability among homeless adults with mental illness: a randomized trial. *JAMA*. 2015;313(9):905–915
- Aubry T, Goering P, Veldhuizen S, et al. A multiple-city RCT of Housing First with assertive community treatment for homeless Canadians with serious mental illness. *Psychiatr Serv*. 2015;67(3):275–281
- US Department of Housing and Urban Development. Rapid rehousing models for homeless youth. Published 2014. Available at: [www.hudexchange.info/homelessness-assistance/resources-for-homeless-youth/rrh-models-for-homeless-youth/](http://www.hudexchange.info/homelessness-assistance/resources-for-homeless-youth/rrh-models-for-homeless-youth/). Accessed April 29, 2016
- Goering PN, Streiner DL, Adair C, et al. The At Home/Chez Soi trial protocol: a pragmatic, multi-site, randomised controlled trial of a Housing First intervention for homeless individuals with mental illness in five Canadian cities. *BMJ Open*. 2011;1(2):e000323
- Sheehan DV, Lecrubier Y, Sheehan KH, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry*. 1998;59(suppl 20):22–33; quiz 34–57
- Tsemberis S, McHugo G, Williams V, Hanrahan P, Stefanic A. Measuring homelessness and residential stability: The Residential Time-Line Follow-Back Inventory. *J Community Psychol*. 2007;35(1):29–42
- Lamers LM, Bouwmans CA, van Straten A, Donker MC, Hakkaart L. Comparison of EQ-5D and SF-6D utilities in mental health patients. *Health Econ*. 2006;15(11):1229–1236
- Lehman AF. Measures of quality of life among persons with severe and persistent mental disorders. *Soc Psychiatry Psychiatr Epidemiol*. 1996;31(2):78–88
- Barker S, Barron N, McFarland BH, Bigelow DA. A community ability scale for chronically mentally ill consumers: Part I. Reliability and validity. *Community Ment Health J*. 1994;30(4):363–383
- Aubry T, Myner J. Community integration and quality of life: a comparison of persons with psychiatric disabilities in housing programs and community residents who are neighbors. *Can J Commun Ment Health*. 1996;15(1):5–20
- Gifford D, Schmook A, Woody C, Vollendorf C, Gervain M. *Construction of a Scale to Measure Consumer Recovery*. Springfield, IL: Illinois Office of Mental Health; 1995
- Ware J Jr, Kosinski M, Keller SDA. A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Med Care*. 1996;34(3):220–233
- Conrad KJ, Yagelka JR, Matters MD, Rich AR, Williams V, Buchanan M. Reliability and validity of a modified Colorado Symptom Index in a national homeless sample. *Ment Health Serv Res*. 2001;3(3):141–153
- Dennis ML, Chan YF, Funk RR. Development and validation of the GAIN Short Screener (GSS) for internalizing, externalizing and substance use disorders and crime/violence problems among adolescents and adults. *Am J Addict*. 2006;15(suppl 1):80–91
- Statistics Canada. General Social Survey - Victimization (GSS). Updated January 18, 2016. Available at: [www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=4504](http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=4504). Accessed April 1, 2016
- Latimer EA, Lecomte T, Becker DR, et al. Generalisability of the individual placement and support model of supported employment: results of a Canadian randomised controlled trial. *Br J Psychiatry*. 2006;189:65–73
- Scott F, Harrison SJ. Case Studies: Calgary, Alberta: The Infinity Project. In: Gaetz S, Scott F, Gulliver T, eds.

*Housing First in Canada: Supporting Communities to End Homelessness.* Toronto, Ontario: Canadian Homelessness Research Network Press; 2013

27. Mullainathan S, Shafir E. *Scarcity: Why Having Too Little Means So Much.* New York, NY: Henry Holt and Company; 2013
28. Poremski D, Stergiopoulos V, Braithwaite E, Distasio J, Nisenbaum

R, Latimer E. Effects of Housing First on employment and income of homeless individuals: results of a randomized trial. *Psychiatr Serv.* 2016;67(6):603–609

## "Housing First" for Homeless Youth With Mental Illness

Nicole Kozloff, Carol E. Adair, Luis I. Palma Lazgare, Daniel Poremski, Amy H. Cheung, Rebeca Sandu and Vicky Stergiopoulos

*Pediatrics* 2016;138;

DOI: 10.1542/peds.2016-1514 originally published online September 28, 2016;

### Updated Information & Services

including high resolution figures, can be found at:  
<http://pediatrics.aappublications.org/content/138/4/e20161514>

### References

This article cites 21 articles, 2 of which you can access for free at:  
<http://pediatrics.aappublications.org/content/138/4/e20161514#BIBL>

### Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):  
**Adolescent Health/Medicine**  
[http://www.aappublications.org/cgi/collection/adolescent\\_health\\_medicine\\_sub](http://www.aappublications.org/cgi/collection/adolescent_health_medicine_sub)  
**Transition to Adult Care**  
[http://www.aappublications.org/cgi/collection/transition\\_adult\\_care\\_sub](http://www.aappublications.org/cgi/collection/transition_adult_care_sub)  
**Advocacy**  
[http://www.aappublications.org/cgi/collection/advocacy\\_sub](http://www.aappublications.org/cgi/collection/advocacy_sub)

### Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:  
<http://www.aappublications.org/site/misc/Permissions.xhtml>

### Reprints

Information about ordering reprints can be found online:  
<http://www.aappublications.org/site/misc/reprints.xhtml>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



# PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

## **"Housing First" for Homeless Youth With Mental Illness**

Nicole Kozloff, Carol E. Adair, Luis I. Palma Lazgare, Daniel Poremski, Amy H. Cheung, Rebeca Sandu and Vicky Stergiopoulos

*Pediatrics* 2016;138;

DOI: 10.1542/peds.2016-1514 originally published online September 28, 2016;

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/138/4/e20161514>

Data Supplement at:

<http://pediatrics.aappublications.org/content/suppl/2016/09/21/peds.2016-1514.DCSupplemental>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2016 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

