Housing Stability Over Two Years and HIV Risk among Newly Homeless Youth

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Abstract

The stability of living situation was examined as a predictor of young people's HIV-related sexual and drug use acts two years after leaving home for the first time. Newly homeless youth aged 12–20 years were recruited in Los Angeles County, California, U.S.A. ($_n$ = 261) and Melbourne, Australia ($_n$ = 165) and followed longitudinally at 3, 6, 12, 18, and 24 months. Their family history of moves and the type and frequency of moves over the two years following becoming newly homeless were examined. Regression analyses indicated that recent sexual risk two years after becoming newly homeless was not related to the instability of youths' living situations; condom use was higher among youth with more placements in institutional settings and among males. Drug use was significantly related to having moved more often over two years and Melbourne youth used drugs significantly more than youth in Los Angeles.

Keywords

Homeless youth; Runaway; Family

Introduction

Internationally, more than half of all new HIV infections occur among youth under the age of 24 (UNAIDS, 2002). The prevalence of HIV, however, remains relatively low among adolescents in developed nations such as Australia and the United States, where only 0.2% of youth are infected (Sweeney, Lindegren, Buehler, Onorato, & Janssen, 1995). In these nations, infected youth are clustered around distinct high-risk groups, such as young men who have sex with men, young injection drug users, and homeless youth. In Los Angeles County, California and Melbourne, Australia, recent self-report data on HIV infection among homeless youth revealed approximately 2% of homeless youth in either country are infected (Milburn, Rotheram, Rice, Mallet, & Rosenthal, 2006a). Other studies have found even higher rates in urban centers: 5.3% in New York (Stricof, Kennedy, Nattell, Weisfuse, & Novick, 1991), 8.2%

in San Francisco (Schalwitz, Goulart, Dunnigan, & Flannery, 1990), and 11.5% in Hollywood (Pfeifer and Oliver, 1997).

There are substantial data indicating that sexual and substance abuse risk acts are consistently much higher among homeless youth compared to their non-homeless peers (Bao, Whitbeck, & Hoyt, 2000; Booth and Zhang, 1997; Johnson, Aschenasy, Herbers, & Gillenwater, 1996; Kipke, O'Connor, Palmer, & MacKenzie, 1995; Milburn et al., 2006a; Rosenthal, Moore, & Buzwell, 1994; Tyler, Whitbeck, Hoyt, & Yoder, 2000; Tyler, Cauce, & Whitbeck, 2004). Compared to rates of risk behaviors among homeless youth from the general population (Centers for Disease Control and Prevention, 2000; Centers for Disease Control and Prevention, 2002) measured in the Youth Risk Behaviors Survey, homeless youth report having four or more sexual partners at 3–4 times the national norm; teenage parenthood is 2–3 times more likely among homeless youth; and marijuana and hard drugs are used twice as often (Milburn et al., 2006a). Similarly, rates reported by the Australian Institute of Health and Welfare show that the homeless youth in Australia report about 4–6 times the rate of hard drug use compared to non-homeless peers in national data sets, as well as 1.5–1.75 times the rate of unprotected sex, and 4–5 times the rate of attempting suicide (Milburn et al., 2006a; Australian Institute of Health and Welfare, 2000; Whitbeck, Hoyt, Yoder, Cauce, & Paradise, 2001).

After becoming homeless, youth are believed to spiral into increasingly marginalized subcultures that increase the frequency of multiple problem behaviors (Ayerst, 1999; Tyler, Hoyt, Whitbeck, & Cauce, 2001). Youth who are homeless for longer periods of time demonstrate significantly more risk behaviors than those who are newly homeless (Milburn et al., 2005; Rosenthal et al., 1994). However, recent longitudinal data on newly homeless youth reveal that most youth do not demonstrate an increasingly dysfunctional pattern of risk behaviors (Mallett, Rosenthal, Myers, Milburn, & Rotheram-Borus, 2004; Milburn et al., 2005). In addition, more than two-thirds of newly homeless youth in Los Angeles County returned home within six months of becoming homeless, as did 50% of newly homeless youth in Melbourne, Australia (Milburn et al., 2006b). It is unclear whether returning home reduces or stops risk behaviors.

A substantial number of studies indicate that homeless adults are 3–9 times more likely to be HIV-positive than adults living in stable housing (Aidala, Cross, Stall, Harre, & Sumartojo, 2005); unstable housing among adults is related to sexual and substance use acts that place them at risk for HIV (Aidala et al., 2005). Existing longitudinal studies have examined homeless adults who are either HIV-positive and/or injecting drug users and have demonstrated the relationship between HIV risk and housing (Aidala et al., 2005; Browning and Olinger-Wilbon, 2003; Castel, 2000; Joseph and Roman-Nay, 1990; Song, Safaeian, Strathdee, Vlahov, & Celentano, 2000). These are compelling data and lead to the question of the current study: is there a similar relationship between HIV risk and stable housing among homeless youth?

There have been multiple explanations for the relationship between housing and HIV risk among adults (Aidala, 2006). These explanations also apply to young people. More than 15 years ago, Hein (1990) noted that location is a critical factor in determining HIV risk acts among young people. Homeless youth in the United States congregate in urban centers, finding housing in areas characterized by sex work and drug dealing (Witkin, Milburn, May, Brooks, & Rotheram-Borus, 2005). For example, 55% of service providers for homeless youth in Los Angeles County are found in the Hollywood area of the city, with no less than 11 large, well-established agencies located within 1.5 miles of this area (Witkin et al., 2005). To survive, young people often become involved in drug use and bartering sex for food and shelter and are drawn into neighborhoods with high rates of drug dealing and sex work. Furthermore, the constant stress of struggling to stabilize one's life, including often traumatic experiences, may lead youth to self-medicate with drugs (Greene, Ennett, & Ringwalt, 1997). Stable social

relationships are often severed, limiting the opportunities for ongoing intimate relationships to provide support to avoid risk.

Because recent data have revealed that large numbers of newly homeless youth return home (Milburn et al., 2006a) and many of these newly homeless youth do not demonstrate the expected downward spiral into increasingly risky behaviors (Mallett et al., 2004; Milburn et al., 2005), we hypothesize that over time, youth who relocate to increasingly stable housing situations, especially in family settings, are less likely to engage in HIV-related risk behaviors. A family setting provides the opportunity for ongoing adult monitoring of peer relationships, educational, and social activities. Parental monitoring is also consistently linked with lower rates of adolescent sexual and substance use behaviors (Crosby et al., 2002; Parker and Benson, 2004; Stanton et al., 2004). A family context is defined as the nuclear and extended family members, but not foster care or group home settings. In this paper we measure housing stability with four different variables in order to unpack the impact of stability on risk behavior.

To examine the robustness of the relationships, we recruited samples in both the United States (Los Angeles County, CA) and Australia (Melbourne, Victoria). Both countries have sophisticated health and shelter systems to care for homeless youth, and youth were recruited from large, urban centers with relatively high HIV rates relative to the rest of the country. Newly homeless youth who left home within the past six months were recruited in each site and reassessed at 3, 6, 12, 18, and 24 months following becoming newly homeless.

Methods

Participants

Newly homeless adolescents were recruited in Los Angeles County, California, in the United States and Melbourne, Australia. Three criteria were used to select participants: (1) age ranging from 12 to 20 years; (2) at least two consecutive nights spent away from home without the parent's or guardian's permission (if under age 17 years) or been told to leave home; and (3) had been away from home for six months or less. Detailed information on the recruitment process and procedures may be found elsewhere (Milburn et al., 2006a). The sampling procedure varied slightly across countries, reflecting differences in the type, number, and geographical distribution of agencies serving homeless youth in each setting. In the United States, sites were selected through a systematic process. First, all of the potential recruitment sites for homeless adolescents in Los Angeles County were identified by interviewing line and supervisory staff in agencies that served homeless adolescents throughout the county (Brooks, Milburn, Witkin, & Rotheram-Borus, 2004). Thirty sites were identified, including 17 shelters and drop-in centers and 13 street hangout sites. Next, the 30 sites were audited at preselected times over three different week-long time periods to determine the number of homeless adolescents that could be found at each site. All of these locations were included as recruitment sites. Interviewers were sent out in pairs to screen and recruit eligible homeless adolescents.

In Australia, recruitment sites were systematically selected from a database of all young people and homeless services across the five metropolitan regions of Melbourne, including shelters (refuges), housing referral sites, employment training and government assistance programs, and preventive service agencies. Service managers were approached to seek permission for their service's involvement in the project. Of the 114 eligible services, 112 agreed to participate, and participants were subsequently recruited from 95 agencies. Each service was given an information session that outlined the project and informed staff of the eligibility criteria for participants. Potentially eligible homeless young people were referred to the study by staff working at these services, either by giving the young person the project's free-call number or telephoning the number on their behalf.

Screening and Recruitment

Interviewers in both countries used a 13-item screen to determine whether youth met the eligibility criteria as homeless and establish whether the youth was newly homeless. All newly homeless youth were recruited. Following screening, voluntary informed consent was obtained from each youth, with the caveats that physical or sexual abuse, suicidal and homicidal feelings would be reported. Informed consent was obtained directly from all participants 18 years and older. For minors, loco parentis consent was obtained from a member of the outreach (recruitment) team, and assent was obtained from the minor. The study fulfilled all human subjects guidelines and was approved by the appropriate Institutional Review Boards at both the U.S. and Australian research centers.

Assessments

The interviewers received approximately 40 h of training, including lectures, role-playing, mock surveys, ethics training, and emergency procedures. All interviews were conducted face-to-face in convenient locations (e.g., private space at service sites, coffee shops, etc.) using an audio computer assisted interview (ACASI) and lasted between 1 and 1½ h. Some of the interview was conducted by the interviewer while more sensitive sections were self-administered. All participants received $20 (local currency) compensation for their time.

HIV-related Sexual and Substance Use Risk Behaviors at Two Years (Outcome Measures)

Youth reported on their recent risky behaviors (recent refers to behaviors over the previous three-month period) at the 24-month follow-up interview using ACASI technology to increase the validity of their responses (Turner et al., 2005). The number of male and female *sexual partners* with whom the youth engaged in vaginal or anal sex was reported, with responses ranging from 0 to 25. Condom use was reported as always, usually/sometimes, or rarely/never. *Drug use* was defined as a single four-category ordinal variable, reported as injecting drug use, hard drug use, alcohol or marijuana use, or no drug use. Hard drug use was defined as drug use that included non-injecting use of heroin, crack or cocaine, inhalants, opiates, amphetamines, and hallucinogens.

Stability of Living Situation at Recruitment and Over the Two-year Observational Period

At the baseline interview, youth reported the number of times their family moved in their lifetime, the number of times the youth had lived in an institutional setting (early adolescent unit, medium-term accommodation, refuge/ shelter/single-room occupancy, hotel/motel, secure welfare unit, juvenile detention center/jail, Job Corps facility or psychiatric hospital), and their history of living away from home. At each follow-up interview, youth reported each living situation since the previous interview. Over the two years, we calculated the following variables based on youth's reports: the total number of moves, the number of months spent at home, the number of placements in institutional settings, and the number of months until the youth first returned home (set to 24 months if the youth never returned). For these longitudinal variables, mean values were used wherever follow-up interviews were not administered. For example, if the 12-month interview was missed by a participant, the number of moves was calculated as a weighted average of the number of moves reported at the 3-, 6-, 18- and 24-month interviews. Of the 314 participants who completed the 24-month interview and were included in the analysis, there were 2 (0.3%) participants who completed only one follow-up in addition to the 24-month interview, 12 (4%) who completed two additional follow-ups, 42 (13%) who completed three additional follow-ups, and 259 (82%) who completed all four additional follow-ups. In addition, time to return home included the time it took the participant to be baselined after leaving home. Information was also collected on background characteristics at recruitment, including site (Los Angeles County or Melbourne), race/ ethnicity, gender, and age.

Descriptions of the lifetime, recent, and summary variables of their living situations over two years were calculated. To provide a more detailed examination of housing stability, we opted to use multiple measures that characterize different and complimentary dimensions of housing stability. A multiple linear regression and two multiple logistic regressions were conducted for the three outcome measures controlling for site, gender, age, lifetime living situations prior to recruitment, lifetime institutional placements, the number of institutional settings reported during the follow-up period, the number of moves over the two-year follow-up period, the number of months living in the family home, and the number of months to return home for the first time. Baseline risk behaviors were also used as predictors in modeling 24-month behaviors to account for behavioral changes over time. Race/ethnicity was not included in the models. This variable was collected differently at the two sites and found not to be predictive of any of the risk behaviors when models were run separately. Site, gender, and age have been previously shown to influence rates of unprotected sex and drug use (Booth and Zhang, 1997; Kipke et al., 1995; Johnson et al., 1996; Milburn et al., 2006a; Tyler et al., 2000).

Results

Twenty-four month data were available for 314 of 426 (74%) newly homeless youth; 183 youth from Los Angeles County (70%) and 131 youth from Melbourne (79%). Baseline refusal rates were less than 7% in the United States and not evaluated in Australia. Based on the baseline sample size, follow-up rates were 83%, 87%, 82%, 81% and 70% in Los Angeles for the 3-, 6-, 12-, 18- and 24-month interviews, respectively; and 72%, 85%, 86%, 82% and 79% in Melbourne. These rates are quite high for a sample of homeless youth, who tend to be difficult to track over time. Most youth who were lost to follow up moved out of state and therefore were inaccessible to the research team. Across sites, there were more females (60%) than males (40%). Of the youth who completed a 24-month assessment, the age at baseline ranged from 12 to 20, with 19% between 12 and 14, 62% between 15 and 17, and 19% between 18 and 20. In Los Angeles County, 17% were White (non-Hispanic), 21% were African-American, 47% were Hispanic, and 15% were of other races/ethnicities.

Table 1 summarizes the rates of risky behaviors reported for the previous three months at the time of the two-year follow-up assessment, which constitute our primary outcome measures. The number of recent sexual partners, presented in categories because of the high skewness, was significantly higher in females compared with males ($\chi^2 = 16.9$, $P < .001$), but not significantly associated with site or age. Youth in Los Angeles County were more likely to be abstinent than those in Melbourne in the three months prior to the two-year follow-up interview ($\chi^2 = 7.3$, $P < .01$), and males were significantly more likely than their female peers to be abstinent ($\chi^2 = 8.1$, $P < .01$). Among sexually active adolescents, condom use was similar by country and age, but varied significantly by gender. Males were significantly more likely to always use a condom than females ($\chi^2 = 5.7$, $P < .05$). The pattern of condom use was similar across countries.

Injection drug use was significantly higher in Melbourne compared to Los Angeles County ($\chi^2 = 5.3$, $P < .05$); this finding was present at the time of the initial recruitment and continued over the two-year follow-up period. Similarly, hard drug use was significantly higher in Melbourne compared to Los Angeles County ($\chi^2 = 4.2$, $P < .05$), but was similar among males and females and across age groups. A significantly higher percentage of Melbourne youth reported using only alcohol and marijuana compared to Los Angeles County ($\chi^2 = 4.6$, $P < .05$), although there was no significant difference across gender and age groups.

Table 2 describes the youth's living situation over their lifetime, prior to leaving home and over the two-year follow-up period; variables measure housing stability. Over their lifetime, newly homeless youth in Melbourne experienced a significantly greater number of moves compared

to youth in Los Angeles County ($\chi^2 = 44.6$, $P < .0001$). More than 70% of the Melbourne youth experienced five or more moves and one in four moved 10 or more times over their lifetime. Only 37% of Los Angeles County youth reported five or more moves and a very small percentage had moved 10 times (4.9%).

Although the living situations of the Melbourne youth were far less stable prior to recruitment, the number of moves was similar across sites, gender, and age in the two years following becoming newly homeless. Los Angeles County youth were significantly more likely to return and stay home than Melbourne youth ($\chi^2 = 36.4$, $P < .0001$): 16.4% returned home quickly and remained there for the next two years, and another 25.7% remained home for more than a year. Only 1.5% of Melbourne youth returned home and stayed there over two years and only 15.3% were at home for a year. Across sites, younger youth were significantly more likely to return home than older youth ($\chi^2 = 39.4$, $P < .0001$). Of youth aged 18–20 years at recruitment, 56% never returned home over the next two years, while 87% of youth under age 15 returned home over the next two years. More Melbourne youth were likely to be in institutional placements over the follow-up period ($\chi^2 = 15.0$, $P < .001$), with older youth significantly more likely to be in institutional settings than their younger peers ($\chi^2 = 10.0$, $P < .05$).

Table 3 details the results of the multivariate regression analyses. We analyzed three primary outcome measures: number of sexual partners at 24 month follow up, condom use in the 90 days prior to 24 month follow up, and drug use in the 90 days prior to 24 month follow up. Controlling for site, gender, and age, there was not a significant relationship between the number of sexual partners with housing stability or type of living situation. Condom use was predicted by sociodemographic characteristics, with males using condoms significantly more often than females (OR = 1.84, $\chi^2 = 4.17$, $P < .05$). The number of placements in institutional settings was also significantly related to higher condom use ($\chi^2 = 6.94$, $P < .01$). The sociodemographic characteristics and housing factors significantly predicted drug use at two years (omnibus $\chi^2 = 68.7$, $P < .0001$). Drug use at 24 months was significantly associated with drug use at baseline ($\chi^2 = 12.7$, $P < .001$ for alcohol/marijuana use; $\chi^2 = 30.3$, $P < .0001$ for hard drug use; and $\chi^2 = 22.4$, $P < .0001$ for injecting drug use). Site was also significantly associated with drug use (OR = 0.38; $\chi^2 = 12.6$, $P < .001$), indicating that Melbourne youth were significantly more likely to use drugs than youth in Los Angeles over the two-year period. Accounting for sociodemographic variables and baseline drug use, drug use at 24 months was related to the number of moves ($\chi^2 = 4.0$, $P < .05$). The more moves a youth made over the two-year follow-up period, the more likely they were to have used serious drugs.

Discussion

Two major unexpected results emerged from this longitudinal study of newly homeless youth over two years. The relationships between sexual and substance use risk acts and housing stability are not general, but very specific. Housing stability is related to drug use, not sexual risk; however, the type of placement (i.e., the number of times in institutional placements) is related to condom use. These results are not consistent with existing literature on homeless adults (Aidala, 2006) or theories of the impact of homelessness on risk (Whitbeck and Hoyt, 1999). The failure to find consistency may be because the sexual and substance use risk acts and housing stability of these newly homeless youth are not as deviant as expected. Housing stability was examined from several angles: the number of moves, months living at home, time to first return home, and time in institutional settings over two years. These are more comprehensive measures than those used in adult studies and may explain some of the atypical findings.

Unlike most studies of chronically homeless youth that show above average rates of sexual risk taking (Booth and Zhang, 1997; Clatts, Davis, Sotheran, & Atillasoy, 1998; Ennett,

Federman, Bailey, Ringwalt, & Hubbard, 1999; Johnson et al., 1996; Kipke et al., 1995; Rotheram-Borus, Koopman, Haignere, & Davies, 1991; Yates, MacKenzie, Pennbridge, & Cohen, 1988), in our sample the sexual behavior of the youth appeared normative at the two-year follow-up interview. About one-third of youth had no partners in the previous three months and another third had only one partner; most young people appeared serially monogamous. A very small number of youth (about 5%) had six or more recent partners, and condom use appeared similar to non-homeless youth (Johnston, O'Malley, Bachman, & Schulenberg, 2006). Sexual risk appears largely unrelated to housing, a finding inconsistent with the longitudinal studies of homeless adults. This is not surprising given that sexual acts such as number of partners and use of condoms are typically private events that are unlikely to be directly observed and do not result in conduct problems such as stealing. Only a very small percentage of youth engage in sex work two years after becoming newly homeless. Frequent moves decrease one's ability to find and sustain a romantic or sexual partnership over time. Therefore, the lack of a relationship between sexual risk and housing has a plausible explanation.

More in keeping with previous studies on the drug using risk behaviors of homeless youth (e.g., Booth and Zhang, 1997; Kipke et al., 1995; Yates et al., 1988), we found that drug use was higher among newly homeless youth in both nations, relative to youth in high schools (National Institute on Drug Abuse, 2005; Centers for Disease Control and Prevention, 2000; Centers for Disease Control and Prevention, 2002; Australian Institute of Health and Welfare, 2000), but not all youth were using drugs. Melbourne youth were much more likely to be injecting drug users than Los Angeles County youth, and also were about a year older than newly homeless youth in Los Angeles. There was a far broader range of prevention services that appeared to act as a safety net for youth at risk of homelessness in Melbourne. The youth who became homeless were more likely to be older, to use drugs, and to engage in injecting drug use. However, it is important to note that only 14 youth injected drugs two years after becoming newly homeless—this remains a very small minority of youth.

Higher rates of drug use are related to unstable housing in the previous two years, reflected in the sum of the number of moves. The drug use findings are similar to the findings for homeless adults, but it is unclear whether ongoing drug use was related to the number of moves or that youth's housing situations were associated with drug dealing and/or use. Drug use was not predicted by the number of months living at home or in institutional settings. Drug use is far more public than sex acts and typically impacts behavior for a prolonged period of time, leading to more pervasive consequences for young people. However, the exact mechanism between drug use and the measure of housing stability is unclear.

Similarly, there is not a clear explanation why young people frequently placed in institutional settings were more likely to use condoms. Again, this finding contradicts prevailing trends found in other data. Incarcerated youth have been characterized as having inconsistent condom use, although these youth are amenable to intervention programs that promote condom use (Magura, Shapiro, & Kang, 1994). About one-third of Los Angeles males were in jail at some point over the two year follow-up period. This figure is surprising. It is unlikely that condom promotion in jails is responsible for the association, given that less than 1% of all prisons and jails in the United States allow inmates to access condoms (May and Williams, 2002). Other institutional settings, however, such as refuges or shelters may be actively engaged in condom promotion, which may account for the relationship we found. Again, studies on the mechanisms that determine this relationship are needed.

Our sample was quite different from the existing literature demonstrating the relationship between risk and housing stability among homeless adults. Our sample was younger, and participants were not selected because they were HIV-positive or engaging in risk acts at the

time of recruitment, as is the case with many other samples. The sample was also quite different from almost all other studies of homeless youth: we followed the sample longitudinally, compared to the more common use of cross-sectional samples. The picture of youth's patterns that emerged over time was quite unexpected. About half of newly homeless youth in Melbourne and three-quarters of Los Angeles County youth returned home over two years. More than two of five Los Angeles County youth were home for a year or more in the two years after becoming newly homeless. These results suggest a substantial bias in all existing studies of homeless youth (i.e., cross-sectional studies taken at a single point in time will over-sample chronically homeless youth who have been on the streets for a longer period of time). The youth in this study reveal pathways out of homelessness more often than into chronic homelessness. Given the modeling and life experiences prior to becoming newly homeless, this is surprising: prior to leaving home, nearly 75% of youth had moved five or more times prior to becoming newly homeless.

We acknowledge several limitations to our study. First, the recruitment procedures used in the two countries were not identical. The differences were dictated by the nature of the service sectors in each nation and how researchers can access youth. Nonetheless, these differences may have resulted in a bias toward slightly older and more risk taking youth being recruited in the Australian sample. Second, we measure housing stability with four different variables which reveal different relationships. Other measures could be proposed that would reveal yet other relationships between housing stability and HIV risk behaviors.

The strengths of the present study include access to unique over-time data on homeless youth, which were collected over a 24 month period in Los Angeles and Melbourne. Because data were collected at the same time in each site, the assessment used in both countries was almost identical, making cross-country comparisons and aggregating data from the two countries possible. Furthermore, while we may not have exhausted the universe of possible metrics of housing stability in this one study, we have presented findings related to four different aspects of housing stability. This disaggregation into different components of stability revealed subtle differences in how risk behaviors are affected by stability, not in general, but in very particular ways.

Overall, our sample points to a window of opportunity to intervene with newly homeless youth to prevent a future of chronic homelessness. The HIV-risk related behaviors typically observed among homeless adults and chronically homeless young people were not present in our sample of newly homeless youth. Perhaps most important, housing instability was not consistently related to HIV-related sexual and substance use risk. There appears to be substantial fluctuation and movement in the housing patterns of newly homeless youth, yet the direction of the moves is not clearly a downward spiral and does not necessarily draw youth into a cycle of chronic homelessness and HIV risk.

Acknowledgments

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Table 1

Sex and drug risk variables at 24 months by site, gender, and age

	Total (n = 314)	Site		Gender		Age		
		AUS (n = 131)	US (n = 183)	Female (n = 189)	Male (n = 125)	12–14 (n = 61)	15–17 (n = 194)	18–20 (n = 59)
Number of partners in past three months at 24 months								
0	111	35 (26.7%)	76 (41.5%)	55 (29.1%)	56 (44.8%)	27 (44.3%)	63 (32.5%)	21 (35.6%)
1	115	54 (41.2%)	61 (33.3%)	85 (45.0%)	30 (24.0%)	20 (32.8%)	74 (38.1%)	21 (35.6%)
2–5	71	35 (26.7%)	36 (19.7%)	42 (22.2%)	29 (23.2%)	12 (19.7%)	44 (22.7%)	15 (25.4%)
6 +	17	7 (5.3%)	10 (5.5%)	7 (3.7%)	10 (8.0%)	2 (3.3%)	13 (67%)	2 (3.4%)
Chi-Square (*P*)		7.7	(.05)	16.9	(<.01)		4.2	(.65)
Condom use in past three months at 24 months (among sexually active, N = 203)								
Never	62	30 (31.3%)	32 (29.9%)	45 (33.6%)	17 (24.6%)	10 (29.4%)	39 (29.8%)	13 (34.2%)
Sometimes	83	41 (42.7%)	42 (39.3%)	58 (43.3%)	25 (36.2%)	14 (41.2%)	55 (42.0%)	14 (36.8%)
Always	58	25 (26.0%)	33 (30.8%)	31 (23.1%)	27 (39.1%)	10 (29.4%)	37 (28.2%)	11 (28.9%)
Chi-Square (*P*)		0.6	(.75)	5.8	(.05)		0.4	(.98)
Injecting drug use at 24 months								
Yes	14	10 (7.6%)	4 (2.2%)	8 (4.2%)	6 (4.8%)	0 (0.0%)	12 (62%)	2 (3.4%)
No	300	121 (92.4%)	179 (97.8%)	181 (95.8%)	119 (95.2%)	61 (100.0%)	182 (93.8%)	57 (96.6%)
Chi-Square (*P*)		5.3	(.02)	0.1	(.81)		4.4	(.11)
Hard drug use at 24 months								
Yes	62	33 (25.5%)	29 (15.8%)	36 (19.0%)	26 (20.8%)	10 (16.4%)	38 (19.6%)	14 (23.7%)
No	252	98 (74.8%)	154 (84.2%)	153 (81.0%)	99 (79.2%)	51 (83.6%)	156 (80.4%)	45 (76.3%)
Chi-Square (*P*)		4.2	(.04)	0.1	(.70)		1.0	(.60)
Alcohol/marijuana use at 24 months								
Yes	155	74 (56.5%)	81 (44.3%)	95 (50.3%)	60 (48.0%)	24 (39.3%)	101 (52.1%)	30 (50.8%)
No	159	57 (43.5%)	102 (55.7%)	94 (49.7%)	65 (52.0%)	37 (60.7%)	93 (47.9%)	29 (49.2%)
Chi-Square (*P*)		4.6	(.03)	0.2	(.69)		3.1	(.22)

Table 2

Predictor variables: living situation and housing stability by site, gender, and age

	Total (n = 314)	Site		Gender		Age		
		AUS (n = 131)	US (n = 183)	Female (n = 189)	Male (n = 125)	12–14 (n = 61)	15–17 (n = 194)	18–20 (n = 59)
Times in an institutional setting before baseline								
Never	270	106 (80.9%)	164 (89.6%)	166 (87.8%)	104 (83.2%)	58 (95.1%)	167 (86.1%)	45 (76.3%)
Once	28	15 (11.5%)	13 (7.1%)	14 (7.4%)	14 (11.2%)	3 (4.9%)	15 (7.7%)	10 (16.9%)
Twice or more	16	10 (7.6%)	6 (3.3%)	9 (4.8%)	7 (5.6%)	0 (0.0%)	12 (6.2%)	4 (6.8%)
Chi-Square (*P*)		5.1	(.08)	1.5	(.47)		10.8 (.03)	
Number of moves before baseline								
0	3	0 (0.0%)	3 (1.6%)	3 (1.6%)	0 (0.0%)	0 (0.0%)	3 (1.5%)	0 (0.0%)
1–4	152	39 (29.8%)	113 (61.7%)	91 (48.1%)	61 (48.8%)	41 (67.2%)	89 (45.9%)	22 (37.3%)
5–9	118	60 (45.8%)	58 (31.7%)	70 (37.0%)	48 (38.4%)	15 (24.6%)	73 (37.6%)	30 (50.8%)
10+	41	32 (24.4%)	9 (4.9%)	25 (13.2%)	16 (12.8%)	5 (8.2%)	29 (14.9%)	7 (11.9%)
Chi-Square (*P*)		44.6	(<.01)	2.0	(.56)		15.3 (.02)	
Number of times in institutional setting between BL & 24 months								
Never	215	77 (58.8%)	138 (75.4%)	137 (72.5%)	78 (62.4%)	49 (80.3%)	131 (67.5%)	35 (59.3%)
Once	56	25 (19.1%)	31 (16.9%)	30 (15.9%)	26 (20.8%)	10 (16.4%)	35 (18.0%)	11 (18.6%)
Twice or more	43	29 (22.1%)	14 (7.7%)	22 (11.6%)	21 (16.8%)	2 (3.3%)	28 (14.4%)	13 (22.0%)
Chi-Square (*P*)		15.0	(<.01)	3.6	(.16)		10.0 (.04)	
Number of moves between BL & 24 months								
0	5	1 (0.8%)	4 (2.2%)	4 (2.1%)	1 (0.8%)	3 (4.9%)	1 (0.5%)	1 (1.7%)
1–4	159	67 (51.1%)	92 (50.3%)	96 (50.8%)	63 (50.4%)	34 (55.7%)	97 (50.0%)	28 (47.5%)
5–9	90	31 (23.7%)	59 (32.2%)	58 (30.7%)	32 (25.6%)	17 (27.9%)	57 (29.4%)	16 (27.1%)
10+	60	32 (24.4%)	28 (15.3%)	31 (16.4%)	29 (23.2%)	7 (11.5%)	39 (20.1%)	14 (23.7%)
Chi-Square (*P*)		6.3	(.01)	3.3	(.34)		8.8 (.18)	
Number of months spent at home between BL & 24 months								
<1	115	69 (52.7%)	46 (25.1%)	68 (36.0%)	47 (37.6%)	8 (13.1%)	71 (36.6%)	36 (61.0%)
1–<2	100	40 (30.5%)	60 (32.8%)	55 (29.1%)	45 (36.0%)	18 (29.5%)	68 (35.1%)	14 (23.7%)
12–<24	67	20 (15.3%)	47 (25.7%)	46 (24.3%)	21 (16.8%)	23 (37.7%)	38 (19.6%)	6 (10.2%)
24	32	2 (1.5%)	30 (16.4%)	20 (10.6%)	12 (9.6%)	12 (19.7%)	17 (8.8%)	3 (5.1%)

	Total (n = 314)	Site		Gender		Age		
		AUS (n = 131)	US (n = 183)	Female (n = 189)	Male (n = 125)	12–14 (n = 61)	15–17 (n = 194)	18–20 (n = 59)
Chi-Square (P)		36.4	(<.01)	3.3	(.35)		39.4 (<.01)	
Follow-ups in familial setting between BL & 24 months								
0	20	20 (15.3%)	0 (0.0%)	12 (6.3%)	8 (6.4%)	0 (0.0%)	13 (6.7%)	7 (11.9%)
1–2	51	39 (29.8%)	12 (6.6%)	31 (16.4%)	20 (16.0%)	2 (3.3%)	39 (20.1%)	10 (16.9%)
3–4	99	37 (28.2%)	62 (33.9%)	54 (28.6%)	45 (36.0%)	13 (21.3%)	59 (30.4%)	27 (45.8%)
5	144	35 (26.7%)	109 (59.6%)	92 (48.7%)	52 (41.6%)	46 (75.4%)	83 (42.8%)	15 (25.4%)
Chi-Square (P)		72.0	(<.01)	2.1	(.54)		38.1 (<.01)	
Follow-ups in non-familial setting between BL & 24 months								
0	15	2 (1.5%)	13 (7.1%)	10 (5.3%)	5 (4.0%)	7 (11.5%)	5 (2.6%)	3 (5.1%)
1–2	130	36 (27.5%)	94 (51.4%)	81 (42.9%)	49 (39.2%)	37 (60.7%)	80 (41.2%)	13 (22.0%)
3–4	91	36 (27.5%)	55 (30.1%)	57 (30.2%)	34 (27.2%)	13 (21.3%)	59 (30.4%)	19 (32.2%)
5	78	57 (43.5%)	21 (11.5%)	41 (21.7%)	37 (29.6%)	4 (6.6%)	50 (25.8%)	24 (40.7%)
Chi-Square (P)		47.2	(<.01)	2.6	(.45)		34.3 (<.01)	
Number of months until first return home								
<1	46	4 (3.1%)	42 (23.0%)	31 (16.4%)	15 (12.0%)	23 (37.7%)	21 (10.8%)	2 (3.4%)
1– <12	99	34 (26.0%)	65 (35.5%)	63 (33.3%)	36 (28.8%)	21 (34.4%)	65 (33.5%)	13 (22.0%)
12–24	65	28 (21.4%)	37 (20.2%)	32 (16.9%)	33 (26.4%)	9 (14.8%)	45 (23.2%)	11 (18.6%)
Never returned	104	65 (49.6%)	39 (21.3%)	63 (33.3%)	41 (32.8%)	8 (13.1%)	63 (32.5%)	33 (55.9%)
Chi-Square (P)		41.4	(<.01)	4.8	(.19)		49.7 (<.01)	

Table 3

Multivariate regressions on risk outcomes

	Estimate	SE	t value	
(A) Linear regression of number of partners at the 24–month assessment (n = 314)				
Intercept	1.16	1.81		
Baseline number of partners	0.07	0.05	1.52	
Site (U.S. vs. Australia)	−0.4	0.37	−1.09	
Gender (male vs. female)	0.16	0.32	0.50	
Age at baseline	0.00	0.10	−0.04	
Lifetime moves before baseline	0.03	0.06	0.46	
Number of moves from BL to 24 months	0.01	0.02	0.43	
Months in home from BL to 24 months	0.03	0.04	0.76	
Time to return home for first time	−0.01	0.04	−0.25	
Did not return home by 24 months	0.46	0.53	0.86	
Times in institutional setting, BL to 24 months	0.03	0.08	0.46	

	Estimate	SE	Odds ratio	95% CI
(B) Ordinal logistic regression of condom use at the 24–month assessment (n = 203)				
Intercept 1	−1.01	1.77		
Intercept 2	0.87	1.77		
Baseline condom use—Sometimes	0.52	0.41	1.69	(0.75, 3.81)
Baseline condom use—Always	0.67	0.39	1.95	(0.90, 4.21)
Site (U.S. vs. Australia)	0.10	0.33	1.11	(0.58, 2.12)
Gender (male vs. female)	0.61[*]	0.30	1.84	(1.03, 3.29)
Age at baseline	−0.10	0.10	0.90	(0.75, 1.09)
Lifetime moves before baseline	0.02	0.05	1.02	(0.92, 1.12)
Number of moves from BL to 24 months	−0.02	0.02	0.98	(0.95, 1.02)
Months in home from BL to 24 months	0.02	0.03	1.02	(0.96, 1.09)
Time to return home for first time	0.03	0.03	1.03	(0.96, 1.11)
Did not return home by 24 months	−0.19	0.51	0.83	(0.31, 2.26)
Times in institutional setting, BL to 24 months	0.19[**]	0.07	1.21	(1.05, 1.39)

	Estimate	SE	Odds ratio	95% CI
(C) Ordinal logistic regression of drug use at the 24-month assessment (n = 314)				
Intercept 1	−3.96	1.36		
Intercept 2	−1.83	1.34		
Intercept 3	0.79	1.33		
Baseline drug use—Alcohol/marijuana	1.11[***]	0.31	3.03	(1.65, 5.57)
Baseline drug use—Hard drugs	1.82[***]	0.33	6.16	(3.22, 11.75)
Baseline drug use—Injecting	2.77[***]	0.58	15.90	(5.06, 50.05)
Site (U.S. vs. Australia)	−0.98[***]	0.28	0.38	(0.22, 0.65)
Gender (male vs. female)	−0.09	0.23	0.91	(0.58, 1.43)

	Estimate	SE	t value	
Age at baseline	−0.05	0.07	0.95	(0.82, 1.09)
Lifetime moves before baseline	0.06	0.04	1.06	(0.98, 1.15)
Number of moves from BL to 24 months	0.03	0.02	1.03	(1.00, 1.07)
Months in home from BL to 24 months	0.01	0.03	1.01	(0.96, 1.06)
Time to return home for first time	0.02	0.03	1.02	(0.96, 1.08)
Did not return home by 24 months	−0.39	0.39	0.68	(0.32, 1.45)
Times in institutional setting, BL to 24 months	0.02	0.06	1.02	(0.92, 1.14)

*
$P < .05$

**
$P < .01$

***
$P < .001$