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Influence of Housing Status on Health Outcomes for Reproductive-Age Women With and Without HIV in the Southern United States

Shreya Ganguly, MD^a, Olivia Christman, BS^b, Qian Yang, PhD^c, C. Christina Mehta, MSPH, PhD^c, Tina T. Tisdale, MPH, MPA, CCRP^c, Ayako Wendy Fujita, MD, MSc^{c,d}, Deborah J. Konkle-Parker, PhD, FNP^e, Maria L. Alcaide, MD^{f,g}, Aadia Rana, MD^h, Seble G. Kassaye, MS, MDⁱ, Elizabeth F. Topper, MEd, MPH, PhD^j, Daniel Westreich, PhD^k, Anandi N. Sheth, MD, MSc^{c,d}

^aEmory University School of Medicine, Atlanta, GA;

^bRollins School of Public Health, Emory University, Atlanta, GA;

^cDivision of Infectious Disease, Department of Medicine, Emory University School of Medicine, Atlanta, GA;

^dPonce de Leon Center, Grady Health System, Atlanta, GA;

^eSchools of Nursing, Medicine, and Population Health Sciences, University of Mississippi Medical Centers, Jackson, MS;

^fDivision of Infectious Diseases, Department of Medicine, University of Miami Miller School of Medicine, Miami, FL;

^gDepartment of Obstetrics and Gynecology, University of Miami Miller School of Medicine, Miami, FL;

^hDivision of Infectious Diseases, Department of Medicine, University of Alabama-Birmingham Heersink School of Medicine, Birmingham, AL;

ⁱDepartment of Medicine, Georgetown University, Washington, DC;

^jDepartment of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD;

^kDepartment of Epidemiology, University of North Carolina-Chapel Hill, Chapel Hill, NC.

Abstract

Background: Housing instability is a modifiable determinant of health outcomes among people with HIV. Reproductive-age women face unique challenges and are underrepresented in HIV research. We characterized housing status among reproductive-age women with and without HIV (WWH/WWoH) and evaluated its associations with health outcomes.

Correspondence to: Anandi N. Sheth, MD, MSc, 341 Ponce De Leon Ave NE, Atlanta, GA 30308 (ansheth@emory.edu).

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Setting: The Study of Treatment and Reproductive Outcomes (STAR) examines women ages 18–45 years with and without HIV in 6 Southern US sites.

Methods: We analyzed baseline data from March 2021–August 2023. We compared demographic, psychosocial, and clinical characteristics by HIV and housing status. We examined associations between housing status and health outcomes using logistic regression models, adjusting for age, race, socioeconomic status, depressive symptoms, and illicit drug use.

Results: Among 759 women (473 with HIV, 286 without HIV), 64.4% had stable housing, 28.9% had dependent housing, and 6.9% had unstable housing. In adjusted models, unstably/dependently housed women were significantly less likely to attend a health care visit in the past year compared with stably housed women (OR 0.40, CI: 0.18 to 0.90). Unstably/dependently housed WWH were significantly more likely to miss at least 1 HIV visit in the past year (OR 2.35, CI: 1.02 to 5.41) and be virally nonsuppressed (OR 2.92, CI: 1.08 to 7.87) than stably housed WWH.

Conclusions: Housing instability was associated with adverse health outcomes, even after adjusting for traditional sociodemographic and psychosocial risk factors. This emphasizes its role as a key health determinant that must be addressed. Further research to assess the potential pathways for this association will inform acceptable and scalable housing interventions to improve outcomes for reproductive-age women.

Keywords

HIV; women; housing; reproductive age

INTRODUCTION

Nearly one-fifth of people with HIV (PWH) in the United States experience housing instability.¹ Housing instability is associated with worse HIV and health-related outcomes, even after adjusting for a range of individual and health care system characteristics.² Housing provision has been shown to improve health outcomes among PWH and individuals at risk for infection who are inadequately housed.^{2–4}

Multilevel, inter-related factors may influence the relationship between housing instability and health outcomes. Unstable housing definitions vary in HIV literature; however, many incorporate the Center for Disease Control’s definition for homelessness, which includes living on the street, shelter, single-room–occupancy hotel, or car at any time during the past 12 months.¹ In 1 study, unstably housed PWH were more likely to experience viral nonsuppression and suffer from substance use and mental health disorders, which have been shown to decrease adherence to antiretroviral therapy (ART).^{5–7} Voluntary dependent housing (“doubling up”) may occur for social, romantic, or economic convenience,⁸ but involuntary dependent housing occurs due to financial disabilities. The latter has been associated with increased risk of homelessness and lower health care utilization, including HIV care.^{9,10} Neighborhood-level factors may also modify the relationship between housing status and health outcomes. For example, neighborhood crime has been linked to reduced access to health-enabling resources such as pharmacies.¹¹ Access to health care may additionally influence awareness of housing resources. The Housing Opportunities for

Persons with AIDS (HOPWA) is a national program which offers housing assistance for low-income PWH and their families.¹² Epidemiologic data linking housing instability to adverse health outcomes despite access to this resource suggest that further investigations must be performed to understand drivers of housing instability among PWH.

Reproductive-age women experience unique challenges and health outcomes in the setting of HIV. Structural, psychosocial, and biological factors manifest differently throughout women's reproductive lives and influence levels of treatment adherence and viral suppression.¹³ For example, pregnancy, the postpartum period, and caregiving responsibilities may influence HIV outcomes for reproductive-age women.^{14–17} Young women belonging to racial and ethnic minority groups disproportionately report lower retention in HIV care; these women are also significantly more likely to experience housing instability.^{18,19} Unstably housed women with HIV (WWH) experience lower odds of retention in HIV care and viral suppression, even after accounting for sociodemographic and behavioral factors.²⁰ However, few studies have characterized housing instability among reproductive-age women who may face unique experiences that affect housing and health outcomes.

We aimed to (1) describe current housing status among reproductive-age women with and without HIV (WWoH) in the Southern United States; (2) characterize sociodemographic and psychosocial factors, including neighborhood safety and sense of community, by housing and HIV status; and (3) examine associations between housing status and health outcomes.

METHODS

Study Design

The Study of Treatment and Reproductive Outcomes (STAR) is an ongoing study of cisgender women ages 18–45 years with and without HIV enrolled in 6 Southern US sites (Atlanta, Georgia; Birmingham, Alabama; Jackson, Mississippi; Chapel Hill, North Carolina; Miami, Florida; and Washington, District of Columbia), encompassing a region in which PWH experience limited access to care and adverse health outcomes compared with people in other US regions.^{21–23} STAR collects longitudinal clinical, behavioral, and laboratory data every 6 months through interviewer-administered questionnaires, biological specimens, and medical record abstraction. For this analysis, we included baseline data from participants enrolled in March 2021 through August 2023. STAR is approved by a single Institutional Review Board at the University of Miami; all participants provided informed consent in English or Spanish.

Housing Status

Housing status was characterized using results of 3 survey items: (1) Where are you living now? (own house/apartment, parent's house, someone else's house/apartment, rooming/halfway house, shelter/welfare hotel, on the street(s)/beach, jail/other correctional facility, residential drug/alcohol treatment facility, car, assisted living, other place); (2) Is the housing where you are living now subsidized? That is, are you paying lower rent because the Federal, State, or local government is paying for part of your rent? (yes, no, not applicable);

and (3) Are you currently on a waiting list for subsidized housing? (yes, no, not applicable). Additional variables included length of stay at current location and number of adults and children living with participants.

For analyses, the primary independent variable was housing status. Participants who reported living in their own house or apartment were categorized as “stably housed.” Participants who reported living in rooming/halfway house, shelter/welfare hotel, on the street(s)/beach, jail/other correctional facility, residential drug/alcohol treatment facility, car, assisted living, or other place were categorized as “unstably housed.” Participants who reported living in their parent’s house or someone else’s house/apartment were grouped into a third category entitled “dependently housed,” based on prior literature. Because STAR data could not differentiate between voluntary and involuntary dependent housing, both groups comprise the “dependently housed” category. For logistic regression models, unstably and dependently housed participants were grouped into one “unstably housed” category.

Covariates

We explored the following self-reported demographic variables: age, race/ethnicity, pregnancy status, marital status, highest level of education, employment status, and annual household income. We also created a combined four-level socioeconomic status variable based on data provided from the education, employment, and income variables (Table 1). Psychosocial covariates included history of incarceration, history of transactional sex, depressive symptoms,²⁴ hazardous drinking,²⁵ tobacco use, marijuana use in the past year, and illicit drug use in the past year.

Sense of community and neighborhood safety were also assessed due to their previously explored influence on health outcomes.^{26,27} Psychological sense of community (PSOC) includes 4 components: needs fulfillment (a perception that “members’ needs will be met by the community”), group membership (a feeling of belonging), influence (a sense that one can make a difference in their community), and emotional connection (a feeling of attachment).²⁸ Participants completed a modified, eight-item Brief Sense of Community Scale (BSCS) to assess the four dimensions of PSOC using a 4-point Likert scale (“not at all” true to “completely” true).²⁷ For neighborhood safety, we used questions aggregated by Mujahid et al^{29,30} that measure dimensions of safety and violence. For both BSCS and neighborhood safety, scores were calculated using averaged responses to each question overall and for each dimension.

Outcomes

Our primary outcome of interest was health care utilization (health care visit in the past year). We also described health insurance status and barriers to health care (time without health insurance, lack of care due to unaffordability, or delayed care due to worry about cost in the past year). For WWH, additional outcomes were: (1) missed HIV care visit in the past year (self-reported) and (2) viral nonsuppression, defined as HIV RNA ≥ 200 copies/mL (using laboratory results collected at the baseline or the 6-month follow-up visit). We additionally described current ART use, ART treatment interruption (off treatment

≥1 week in the past 6 months), ART adherence (self-reported as almost always/always, sometimes/usually, never/rarely), and CD4⁺ lymphocyte count.

Statistical Analysis

We summarized and compared demographic, psychosocial, and housing characteristics by HIV and housing status using t-tests or ANOVA for continuous variables, Wilcoxon rank-sum tests or Kruskal–Wallis tests for non-normally distributed continuous variables, χ^2 tests for categorical variables, and Fisher exact tests when expected cell counts were <5. Mean values for BSCS, neighborhood safety/violence, and age were summarized by HIV and housing status and compared using Kruskal–Wallis tests. We used χ^2 and Fisher exact tests to examine the association between housing status and each health outcome, overall and stratified by HIV status. For WWH, we examined the association between housing status and HIV outcomes using the same methods. Finally, we evaluated the association between housing status and health care visit attendance in the past year using a logistic regression model, adjusting for age, race, socioeconomic status, depressive symptoms, and illicit drug use (variables previously associated with housing status and health outcomes^{2,17}). Among WWH, we evaluated the association between housing status and (1) missed HIV care visits, and (2) viral nonsuppression, using logistic regression models that adjusted for these same variables. Given the associations in the literature between both unstable and dependent housing and adverse health outcomes, along with the sample size limitations based on the relatively small group reporting unstable housing, these categories were analyzed separately in unadjusted analyses but combined in for the multivariable logistic regression models. Statistical analysis was performed in SAS v9.4 with $\alpha = 0.05$ for all analyses.

RESULTS

Characteristics of the Study Population

Among 759 women, the mean age was 36 years, and 74.9% self-identified as non-Hispanic Black (Table 1). Most were unmarried/unpartnered (71.1%) and were not currently/recently pregnant (77.1%). Approximately half were unemployed (50.1%) and reported their annual household income as >\$24,000 (57.3%). More than one-third (34.5%) reported a history of incarceration and 9.3% reported transactional sex. Overall, 30.4% reported currently using tobacco, 13.6% reported hazardous drinking, 44.9% reported marijuana use, and 11.2% reported illicit drug use in the past year; 36.3% reported depressive symptoms (CES-D ≥16).

Overall, 90.7% of participants reported having a health care visit in the past year (see Table 1, Supplemental Digital Content, <http://links.lww.com/QAI/C541>). Most (96.1%) reported having health insurance. However, 15.5% reported time in the past year with no health insurance and 13.5% reported not getting care because of unaffordability in the past year.

Among WWH, 96.6% reported a HIV care visit in the past year. Nearly all (98.5%) endorsed ART use, and 87.3% reported that they “almost always/always” take their prescribed HIV medications. Overall, 91.9% of participants had a CD4 count >200 c/mL and 80.5% were virally suppressed; however, 70 of 473 had missing CD4 data and 227 of 473 had missing HIV RNA data.

Housing Status

Overall, 64.4% of women had stable housing, 28.9% had dependent housing, and 6.9% had unstable housing; this did not significantly vary by HIV status (Table 2, $P = 0.2995$). Among dependently housed participants, 13.6% lived in their parents' house and 15.3% lived in someone else's house/apartment. Among unstably housed women, the most common housing reported was living in a shelter/welfare hotel (41.2%). On average, women reported living with 1 adult and taking care of 1 child. In total, 26.6% of participants reported living in subsidized housing and 12.6% reported being on a waiting list for subsidized housing. WWH reported significantly higher rates of subsidized housing and status on a waiting list than WWoH ($P < 0.0001$). Overall, 40.6% reported living at their current address for less than 5 years.

Age, marital status, employment, annual household income, socioeconomic status, incarceration history, history of transactional sex, depressive symptoms, hazardous drinking, tobacco use, and drug use varied by housing status (all $P < 0.05$, Table 3 and Table 2, Supplemental Digital Content, <http://links.lww.com/QAI/C541>).

Sense of Community and Neighborhood Safety

The average response for all 8 items on the BSCS was 2.3 (SD = 0.8), indicating that the average participant felt a moderately low sense of community in their neighborhood. The mean values for each dimension of the BSCS included 2.5 (SD = 1.0) for needs fulfillment, 2.4 (SD = 1.1) for group membership, 2.0 (SD = 1.0) for influence, and 2.3 (SD = 1.0) for emotional connection; these did not differ by HIV or housing status (see Table 3, Supplemental Digital Content, <http://links.lww.com/QAI/C541>).

The mean score for neighborhood safety was 2.6 (SD = 1.2), indicating that the average participant either felt neutral or agreed with positive statements about safety in their neighborhood. The mean score for neighborhood violence was 3.4 (SD = 0.8), indicating that the average participant rarely experienced fights, gang fights, sexual assault/rape, or robbery/mugging in their neighborhood during the past 6 months, and this did not differ by HIV or housing status.

Health care Utilization and Barriers

There were significant associations between housing category and health care utilization and barriers. A lower proportion of unstably housed participants had seen a health care provider in the past year (82.4%) compared with dependently (89.4%) and stably (92.3%) housed participants (Table 3). Unstably housed participants reported time in the past year with no health insurance (30.0%), not getting care because of unaffordability in the past year (29.4%), and delayed seeking of care because of worry about cost in the past year (23.5%) more frequently than dependently or stably housed participants (Table 3).

In the logistic regression model, women who were unstably or dependently housed were significantly less likely to have a health care visit in the past year (odds ratio [OR] 0.44, 95% confidence interval [CI]: 0.21 to 0.96); this association persisted after adjusting for sociodemographic and psychosocial variables (OR 0.40, CI: 0.18 to 0.90, Table 4).

When stratifying by HIV status (see Table 4, Supplemental Digital Content, <http://links.lww.com/QAI/C541>), lack of care because of unaffordability in the past year was the only health care barrier that varied significantly by housing status among WWH; unstably housed WWH reported lack of care because of unaffordability more than dependently and stably housed participants. Among WWH, lack of care because of unaffordability in the past year and delayed seeking of care because of worry about cost in the past year varied significantly by housing status (all $P < 0.05$). Unstably housed WWH reported time in the past year with no health insurance more than dependently and stably housed WWH as well as lack of care because of unaffordability in the past year more than dependently and stably housed WWH. Unstably and dependently housed WWH reported similar rates of delayed seeking of care that were higher than stably housed WWH.

HIV Characteristics and Outcomes

A higher proportion of unstably housed WWH missed at least 1 HIV visit in the past year (30.3%) compared with dependently (18.8%) or stably (14.5%) housed participants. In addition, viral suppression was lower among WWH who were unstably housed (57.1%) compared with women who were dependently (83.3%) or stably housed (82.2%). Adherence to HIV medications, status off-treatment ≥ 1 week in the past 6 months, CD4 cell count, and viral suppression also significantly varied by housing status (all $P < 0.05$, Table 3). Unstably housed WWH were less likely to report “almost always/always” taking their prescribed HIV medicines (78.8%) than dependently (94.3%) and stably (85.3%) housed WWH. They were also more likely to report being off treatment in the past 6 months (48.5%) than dependently (29.0%) and stably housed (25.1%) WWH. CD4 < 200 c/mL was more common among unstably (25.8%) versus dependently (6.6%) and stably housed (6.7%) WWH.

In a logistic regression model, WWH who were unstably or dependently housed were significantly more likely to have a missed HIV care visit in the past year (OR 2.43, CI: 1.11 to 5.34, Table 4); this association persisted after adjusting for sociodemographic and psychosocial variables (OR 2.35, CI: 1.02–5.41). WWH who were unstably or dependently housed were also significantly more likely to have viral nonsuppression (OR 3.58, CI: 1.41 to 9.07), which persisted after adjusting for sociodemographic and psychosocial variables (OR 2.92, CI: 1.08 to 7.87).

DISCUSSION

To the best of our knowledge, this is the first study describing housing in a contemporary cohort of reproductive-age women with and without HIV. In this cohort, 6.9% of women were unstably housed and nearly one-third were either currently using subsidized housing or on a waiting list. This mirrors national estimates for the prevalence of homelessness among PWH (9% in 2022¹) and highlights the high overall unmet housing needs in this population. Notably, unstable housing did not vary significantly by HIV status in this cohort, but WWH were more likely to use or be on a waiting list for subsidized housing. Considering the caregiving responsibilities and health needs faced by this group, it is imperative that housing interventions address the unique needs of reproductive-aged WWH, including those that expand awareness, eligibility, accessibility, utilization, and funding for HOPWA.

Continued barriers exist to available housing assistance programs for this population. For example, HOPWA assistance is currently limited to low-income individuals who make an annual income at 80 percent of the area's median income or below.³¹ Given that most unstably housed participants reported annual incomes greater than \$24,000, ineligibility may be a factor influencing housing status. Additional limitations for those who face unemployment, prior incarceration, or drug use may also affect access to housing. Reducing these barriers and adding tailored interventions to address waiting list bloat for subsidized housing are urgently needed for this population. Finally, as WWoH had similar levels of housing instability, housing interventions are also urgently needed for women at risk for HIV. This population may benefit from HIV testing and prevention services in nontraditional care settings such as homeless shelters.³²

Unstably housed women experienced adverse social determinants of health and comorbid conditions that may influence health care utilization and HIV outcomes by both propagating housing instability and through other intersecting pathways. They reported more unemployment, depressive symptoms, history of incarceration, transactional sex, hazardous drinking, and drug use than dependently and stably housed women. It has been shown that substance use disorders and mental illness are independent risk factors for housing instability and worse HIV outcomes.^{5,6,33} However, studies have also shown that housing interventions may improve depression and substance use behaviors. For example, a randomized control trial of unstably housed PWH assigned to immediate HOPWA assistance or customary care found that prompt receipt of housing led to significant improvements in self-reported physical and mental health, including levels of depression and perceived stress.³⁴ In addition, studies have shown that stable housing can overcome the adverse effects of social determinants on HIV outcomes. One multisite study of PWH who inject drugs found that stably housed people were twice as likely to use ART as those without stable housing.³⁵ Given the interconnected relationship between housing status, social determinants, and comorbid mental health conditions, interventions focused on addressing each of these concerns may synergistically improve HIV outcomes.

PSOC and neighborhood safety also must be considered in housing interventions because they encourage positive health behaviors. Community-level interventions have been shown to reduce sexual risk behaviors in unstably housed women.³⁶ Sense of community has also been shown to buffer a negative relationship between neighborhood safety and depressive symptoms.³⁷ The dimensions of PSOC vary and strengthen over the duration of time spent in a stable living environment.³⁸ Thus, stable housing in a safe neighborhood over a prolonged duration of time may improve outcomes both by increasing health care utilization and by catalyzing positive health behaviors.

Importantly, housing instability affected both health care utilization and its barriers. For example, unstably housed participants had significantly lower health care visit attendance in the past year, even after adjusting for sociodemographic and psychosocial risk factors that contribute to poor access to care. In addition, unstably housed individuals reported several barriers to care, including time without health insurance and lack of or delayed seeking of care due to cost concerns. Interestingly, dependently housed participants, who made up one-third of the cohort, also reported many of these insurance and cost-related

barriers. One limitation of this study is that dependently housed participants could not be identified as voluntary or involuntarily doubled up. Given their higher concerns about health care costs, it is possible that a proportion of respondents were involuntarily dependently housed due to financial hardship. Currently, the federal definition of homelessness does not include the involuntary doubled up population.³⁹ Consequently, individuals who are involuntarily dependently housed may be disqualified from critical housing services such as HOPWA. Given that dependently housed people experience cost-related barriers to health care utilization, future changes to the federal definition could consider forms of involuntary dependent housing.⁴⁰ This may help reverse the common progression of housing instability from dependent housing to homelessness, improve access to care, and promote health.⁴¹

Unstable housing was associated with significantly worse HIV outcomes for reproductive-age WWH, consistent with prior literature in PWH.^{42,43} Housing instability was associated with over twice the odds of having a missed HIV care visit and over three times the odds of viral nonsuppression, suggesting that housing may be an independent driver of these health outcomes. WWH are disproportionately low-income, responsible for caregiving and household work even when working outside the home, and vulnerable to trauma.⁴² Receipt of housing assistance has been shown to predict transition into HIV care even after adjusting for sociodemographic factors.^{43,44} Therefore, addressing unmet housing needs through continued commitment to and potential expansion of HOPWA and other housing programs remains a critical intervention to end the HIV epidemic, including in reproductive-age women. Additional policy and practice implications of these findings include expanding screening people with HIV for housing instability within the health care setting and developing novel approaches to connect reproductive-age women to existing housing programs.⁴⁵

This study has several limitations. A significant proportion of laboratory data was missing, skewing the analysis of housing's influence on HIV outcomes. This cross-sectional analysis of participants could not assess housing over time or determine causality between housing instability and adverse outcomes. Further research is needed to better understand the mediating roles that social determinants, co-occurring health conditions, sense of community, neighborhood safety, and other factors may have on the relationship between housing and outcomes to design acceptable housing interventions for this group. Finally, many factors were assessed by self-report and may be subject to bias.

CONCLUSIONS

Housing instability did not vary by HIV status but was associated with adverse health outcomes in reproductive-aged women with and without HIV. This work adds to the body of literature in PWH and the general population supporting that housing is a key cornerstone of health. Future research into mechanisms of housing instability and interventions to address unmet housing needs is urgently needed to inform allocation of funding for housing resources among reproductive-age women.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Demographic and Psychosocial Characteristics of Reproductive-Age Women With and Without HIV in the Southern United States, 2021–2023

TABLE 1.

Participant Characteristics, N (%) or Median (Q1–Q3)	Total, N = 759	Women with HIV, N = 473	Women without HIV, N = 286	P *
Age, yr	36.0 (29.5–40.9)	37.4 (31.5–41.6)	32.2 (26.1–39.6)	0.0001
Race				<0.0001
Non-Hispanic Black	567 (74.9)	378 (80.1)	189 (66.3)	
Other	190 (25.1)	94 (19.9)	96 (33.7)	
Pregnancy status				0.0767
Currently pregnant	80 (10.6)	59 (12.6)	21 (7.4)	
Recently pregnant [†]	93 (12.3)	58 (12.3)	35 (12.3)	
Neither	582 (77.1)	353 (75.1)	229 (80.4)	
Marital status				0.0788
Married/partner	219 (28.9)	147 (31.1)	72 (25.2)	
Unmarried/no partner	539 (71.1)	325 (68.9)	214 (74.8)	
Highest level of education				<0.0001
≤high school graduation	422 (55.7)	291 (61.7)	131 (45.8)	
>High school graduation	336 (44.3)	181 (38.4)	155 (54.2)	
Employed (full/part-time)				0.1266
No	379 (50.1)	246 (52.2)	133 (46.5)	
Yes	378 (49.9)	225 (47.8)	153 (53.5)	
Annual household income				0.0001
≤\$24,000	07 (42.7)	167 (37.2)	140 (51.9)	
>\$24,000	412 (57.3)	282 (62.8)	130 (48.2)	
Socioeconomic status [‡]				<0.0001
Level 1	202 (26.7)	148 (31.4)	54 (18.9)	
Level 2	167 (22.0)	102 (21.6)	65 (22.7)	
Level 3	150 (19.8)	104 (22.0)	46 (16.1)	
Level 4	239 (31.5)	118 (25.0)	121 (42.3)	
Ever jailed/incarcerated				0.9669
No	496 (65.5)	309 (65.5)	187 (65.6)	
Yes	261 (34.5)	163 (34.5)	98 (34.4)	

Participant Characteristics, N (%) or Median (Q1–Q3)	Total, N = 759	Women with HIV, N = 473	Women without HIV, N = 286	P *
Ever had sex for drugs, money, shelter				0.4471
No	677 (90.8)	424 (91.4)	253 (89.7)	
Yes	69 (9.3)	40 (8.6)	29 (10.3)	
Depressive symptoms [§]				0.2146
No	478 (63.7)	291 (62.1)	187 (66.6)	
Yes	272 (36.3)	178 (38.0)	94 (33.5)	
Hazardous drinking ^{//2}				0.0051
No	635 (86.4)	410 (89.1)	225 (81.8)	
Yes	100 (13.6)	50 (10.9)	50 (18.2)	
Tobacco use				0.2523
Current	228 (30.4)	139 (29.6)	89 (31.7)	
Former	97 (12.9)	68 (14.5)	29 (10.3)	
Never	425 (56.7)	262 (55.9)	163 (58.0)	
Marijuana use in past year				0.0032
No	414 (55.1)	278 (59.3)	136 (48.2)	
Yes	337 (44.9)	191 (40.7)	146 (51.8)	
Illicit drug use in past year [¶]				0.0237
No	667 (88.8)	426 (90.8)	241 (85.5)	
Yes	84 (11.2)	43 (9.2)	41 (14.5)	

Data are presented as No. (%) unless otherwise indicated. Column percentages may not total 100 due to rounding.

* χ^2 test performed for categorical variables by HIV status; Wilcoxon rank-sum test used for age.

[†] Pregnant within the past 2 years.

[‡] Level 1 ($\leq$ high school, unemployed, and $<150\%$ below federal poverty level), Level 2 ($\leq$ high school, unemployed or $<150\%$ below federal poverty level), Level 3 (either $\leq$ high school, unemployed, or $<150\%$ below federal poverty level), and Level 4 ($\geq$ high school education, either employed or $\geq 150\%$ below federal poverty level).

[§] CESD score ≥ 16 .

^{//} AUDIT scale ≥ 8 .

[¶] Including nonmedical use of cocaine, methamphetamines, other stimulants, opioids, benzodiazepines, barbiturates, or other drugs (eg, hallucinogens, inhalants) in the past year. AUDIT, Alcohol Use Disorders Identification Test; CESD, Center for Epidemiologic Studies–Depression.

TABLE 2.
Housing Status Among Reproductive-Age Women With and Without HIV in the Southern United States, 2021–2023

Participant Characteristics, N (%) or Median (Q1–Q3)	Total, N=759	Women with HIV, N = 473	Women without HIV, N = 286
Median number of adults living with participant	1 (0–2)	1 (0–2)	1 (0–2)
Median number of children participant takes care of	1 (0–2)	1 (0–2)	1 (0–2)
Residence			
Your own house or apartment	488 (64.4)	312 (66.1)	176 (61.5)
Parent's house	103 (13.6)	53 (11.2)	50 (17.5)
Someone else's house or apartment	116 (15.3)	74 (15.7)	42 (14.7)
Rooming, boarding, or halfway house	8 (1.1)	4 (0.9)	4 (1.4)
Shelter or welfare hotel	21 (2.8)	19 (4.0)	2 (0.7)
On the street(s) (beach)	10 (1.3)	4 (0.9)	6 (2.1)
Jail or other correctional facility	0	0	0
Residential drug, alcohol treatment facility	2 (0.3)	1 (0.2)	1 (0.4)
In car	3 (0.4)	0	3 (1.1)
In assisted living	2 (0.3)	2 (0.4)	0
In other place	5 (0.7)	3 (0.6)	2 (0.7)
Housing categories			
Stably housed	488 (64.4)	312 (66.1)	176 (61.5)
Dependently housed	219 (28.9)	127 (26.9)	92 (32.2)
Unstably housed	51 (6.9)	33 (7.0)	18 (6.3)
Subsidized housing status			
In subsidized housing			
No	553 (73.4)	334 (71.2)	219 (77.1)
Yes	200 (26.6)	135 (28.8)	65 (22.9)
On waiting list for subsidized housing			
No	484 (87.4)	287 (85.7)	197 (90.0)
Yes	70 (12.6)	48 (14.3)	22 (10.1)

Data are presented as No. (%) unless otherwise indicated. Column percentages may not total 100 due to rounding.

TABLE 3.
Demographic, Psychosocial, and Health care Characteristics of Reproductive-Age Women in the Southern United States, Stratified by Housing Status, 2021–2023

Participant Characteristics, N (%) or Median (Q1–Q3)	Stably Housed, N = 484	Dependently Housed, N = 219	Unstably Housed, N = 51	P *
Demographic characteristics				
Age, yr	37.3 (31.3–41.7)	31.4 (26.2–38.0)	38.6 (32.8–40.6)	<0.0001
Race				0.2744
Non-Hispanic Black	373 (76.8)	157 (71.7)	36 (70.6)	
Other	113 (23.3)	62 (28.3)	15 (29.4)	
Pregnancy status **				0.0764
Currently pregnant	46 (9.5)	31 (14.2)	3 (5.9)	
Recently pregnant [†]	54 (11.2)	34 (15.5)	5 (9.8)	
Neither	384 (79.3)	154 (70.3)	43 (84.3)	
Marital status				0.0008
Married/partner	163 (33.4)	43 (19.6)	13 (25.5)	
Unmarried/no partner	325 (66.6)	176 (80.4)	38 (74.5)	
Highest level of education				0.0573
≤High school	261 (53.5)	125 (57.1)	36 (70.6)	
>High school	227 (46.5)	94 (42.9)	15 (29.4)	
Employed (full/part-time)				0.0312
No	228 (46.8)	119 (54.3)	32 (62.8)	
Yes	259 (53.2)	100 (45.7)	19 (37.3)	
Annual household income				<0.0001
≤\$24000	210 (44.1)	91 (46.9)	6 (12.2)	
>\$24000	266 (55.9)	103 (53.1)	43 (87.8)	
Socioeconomic status [‡]				0.0357
Level 1	123 (25.2)	57 (26.0)	22 (43.1)	
Level 2	103 (21.1)	54 (24.7)	10 (19.6)	
Level 3	95 (19.5)	43 (19.6)	12 (23.5)	
Level 4	167 (34.2)	65 (29.7)	7 (13.7)	
Psychosocial characteristics				

Participant Characteristics, N (%) or Median (Q1–Q3)	Stably Housed, N = 484	Dependently Housed, N = 219	Unstably Housed, N = 51	P *
Ever jailed/incarcerated				<0.0001
No	342 (70.1)	141 (64.4)	13 (26.0)	
Yes	146 (29.9)	78 (35.6)	37 (74.0)	
Ever had sex for drugs, money, shelter				<0.0001
No	447 (92.9)	198 (92.5)	31 (62.0)	
Yes	34 (7.1)	16 (7.5)	19 (38.0)	
Depressive symptoms ^{\$}				<0.0001
No	327 (67.8)	132 (60.8)	19 (38.0)	
Yes	155 (32.2)	85 (39.2)	31 (62.0)	
Hazardous drinking ^{//}				0.0007
No	416 (89.1)	182 (84.3)	36 (70.6)	
Yes	51 (10.9)	34 (15.7)	15 (29.4)	
Tobacco use ^{**}				<0.0001
Current	140 (29.1)	56 (25.8)	32 (64.0)	
Former	67 (13.9)	27 (12.4)	3 (6.0)	
Never	275 (57.1)	134 (61.8)	15 (30.0)	
Marijuana use in past year				0.3839
No	273 (56.6)	117 (53.9)	24 (47.1)	
Yes	209 (43.4)	100 (46.1)	27 (52.9)	
Illicit drug use in past year [#]				<0.0001
No	436 (90.5)	196 (90.3)	34 (66.7)	
Yes	46 (9.5)	21 (9.7)	17 (33.3)	
Health care utilization and barriers in the past year				0.0528
Health care visit in the past year				
No	38 (7.8)	23 (10.6)	9 (17.7)	
Yes	447 (92.2)	194 (89.4)	42 (82.4)	
Health insurance [#]				0.0945
No	47 (9.7)	33 (15.2)	7 (13.7)	
Yes	438 (90.3)	184 (84.8)	44 (86.3)	
Any time with no health insurance				0.0002

Participant Characteristics, N (%) or Median (Q1–Q3)	Stably Housed, N = 484	Dependently Housed, N = 219	Unstably Housed, N = 51	P *
No	387 (88.4)	149 (78.4)	28 (70.0)	
Yes	51 (11.6)	41 (21.6)	12 (30.0)	
Did not get care because of unaffordability				<0.0001
No	439 (90.7)	175 (80.7)	36 (70.6)	
Yes	45 (9.3)	42 (19.4)	15 (29.4)	
Delayed care because of worry about cost				0.0086
No	422 (87.2)	172 (79.3)	39 (76.5)	
Yes	62 (12.8)	45 (20.7)	12 (23.5)	
HIV Characteristics				
HIV Care in the past year **				0.0842
No	7 (2.3)	8 (6.4)	1 (3.0)	
Yes	302 (97.7)	117 (93.6)	32 (97.0)	
Missed scheduled HIV care in past year				0.0638
No	265 (85.5)	104 (83.2)	23 (69.7)	
Yes	45 (14.5)	21 (16.8)	10 (30.3)	
ART use **				1.0000
No	5 (1.6)	2 (1.6)	0 (0)	
Yes	307 (98.4)	124 (98.4)	33 (100)	
Off treatment ≥ 1 wk in the past months				0.0161
No	230 (74.9)	88 (71.0)	17 (51.5)	
Yes	77 (25.1)	36 (29.0)	16 (48.5)	
Adherence to prescribed HIV medicines **				0.0315
Never/rarely	12 (3.9)	1 (0.8)	1 (3.0)	
Sometimes/usually	33 (10.8)	6 (4.9)	6 (18.2)	
Almost always/always	261 (85.3)	116 (94.3)	26 (78.8)	
CD4 >200 cells/ μ L **				0.0009
No	18 (6.7)	7 (6.6)	8 (25.8)	
Yes	251 (93.3)	99 (93.4)	23 (74.2)	
HIV RNA <200 c/mL **				0.0183
No	26 (17.7)	13 (16.7)	9 (42.9)	

Participant Characteristics, N (%) or Median (Q1–Q3)				N = 484	Dependently Housed, N = 219	Unstably Housed, N = 51	P *
Yes				121 (82.3)	65 (83.3)	12 (57.1)	
Data are presented as No. (%) unless otherwise indicated. Column percentages may not total 100 due to rounding.							
* χ^2 test performed for categorical variables by housing status; Fisher exact with cells <5 (**) and Kruskal–Wallis test for age.							
† Pregnant within the past 2 years.							
‡ Level 1 ($\leq$ high school, unemployed, and <150% below federal poverty level), Level 2 ($\leq$ high school, unemployed or <150% below federal poverty level), Level 3 (either $\leq$ high school, unemployed, or <150% below federal poverty level), and Level 4 ($\geq$ high school education, either employed or $\geq$ 150% below federal poverty level).							
§ CESD score $\geq$ 16.							
AUDIT scale $\geq$ 8.							
¶ Including nonmedical use of cocaine, methamphetamines, other stimulants, opioids, benzodiazepines, barbiturates, or other drugs (eg, hallucinogens, inhalants) in the past year.							
# Insurance = self-reported health insurance, ADAP, and/or Ryan White Program.							
** Overall, 227/473 had missing HIV RNA and 70/473 had missing CD4.							
ADAP, AIDS Drug Assistance Program; AUDIT, Alcohol Use Disorders Identification Test; CESD, Center for Epidemiologic Studies–Depression.							

TABLE 4.
Characteristics Associated With Selected Health Outcomes Among Women Living With HIV and Without HIV in the Southern United States

Characteristics, N (%) or Median (Q1–Q3)	Health care Visit in the Past Year				Adjusted OR* (95% CI)
	Health care Visit, N = 684	No Health care Visit, N = 70	Unadjusted OR (95% CI)		
Age (yr) [†]	36.3 (29.5–40.9)	33.7 (28.8–39.6)	1.03 (0.99–1.06)		1.03 (0.99–1.06)
Race					
Non-Hispanic Black	515 (75.5)	48 (68.6)	1.41 (0.83–2.41)		1.37 (0.79–2.38)
Other	167 (24.5)	22 (31.4)	Ref		Ref
Housing					
Unstably housed [‡]	42 (6.2)	9 (12.9)	0.44 (0.21–0.96)		0.40 (0.18–0.90)
Stably housed	641 (93.9)	61 (87.1)	Ref		Ref
Socioeconomic status [§]					
Level 1	181 (26.5)	19 (27.1)	0.97 (0.51–1.84)		0.93 (0.47–1.83)
Level 2	152 (22.3)	14 (20.0)	1.10 (0.55–2.22)		1.07 (0.52–2.17)
Level 3	133 (19.5)	15 (21.4)	0.90 (0.45–1.79)		0.87 (0.43–1.77)
Level 4	217 (31.8)	22 (31.4)	Ref		Ref
Depressive symptoms					
Yes	246 (36.4)	24 (34.3)	1.10 (0.65–1.84)		1.21 (0.70–2.07)
No	430 (63.6)	46 (65.7)	Ref		Ref
Illicit drug use in past year					
Yes	76 (11.2)	8 (11.4)	0.98 (0.45–2.13)		1.16 (0.51–2.61)
No	601 (88.8)	62 (88.6)	Ref		Ref
Missed HIV Care Visit in the Last Year					
Characteristics	No Missed Visit	Missed Visit	Unadjusted OR (95% CI)		Adjusted OR (95% CI)
N (%) or median (Q1–Q3)	N = 393	N = 76			
Age (yr) [†]	37.5 (31.6–41.4)	36.6 (29.9–42.0)	0.99 (0.95–1.03)		0.99 (0.95–1.03)
Race					
Non-Hispanic Black	313 (79.8)	61 (80.3)	1.03 (0.55–1.90)		0.99 (0.53–1.87)
Other	79 (20.2)	15 (19.7)	Ref		Ref

Housing		23 (5.9)	10 (13.2)	2.43 (1.11–5.34)	2.35 (1.02–5.41)
Unstably housed [‡]				Ref	Ref
Stably housed	369 (94.1)	66 (86.8)			
Socioeconomic status [§]					
Level 1	113 (28.8)	34 (44.7)	2.63 (1.30–5.35)	2.44 (1.18–5.04)	
Level 2	83 (21.2)	18 (23.7)	1.90 (0.87–4.16)	1.67 (0.75–3.74)	
Level 3	91 (23.2)	12 (15.8)	1.15 (0.49–2.69)	1.05 (0.44–2.48)	
Level 4	105 (26.8)	12 (15.8)	Ref	Ref	Ref
Depressive symptoms					
Yes	142 (36.4)	35 (46.7)	1.53 (0.93–2.52)	1.35 (0.80–2.27)	
No	248 (63.6)	40 (53.3)	Ref	Ref	Ref
Illicit drug use in past year [¶]					
Yes	36 (9.2)	7 (9.3)	1.01 (0.43–2.37)	0.66 (0.27–1.64)	
No	354 (90.8)	68 (90.7)	Ref	Ref	Ref
Viral Nonsuppression					
Characteristics, N (%) or median (Q1-Q3)		HIV RNA <200c/mL N = 198	HIV RNA ≥200c/mL N = 48	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age (yr) [‡]		36.4 (30.4–40.9)	37.9 (29.4–41.5)	1.01 (0.96–1.07)	1.00 (0.95–1.06)
Race					
Non-Hispanic Black		155 (78.3)	37 (77.1)	0.93 (0.44–1.98)	0.98 (0.44–2.17)
Other		43 (21.7)	11 (23.0)	Ref	Ref
Housing					
Unstably housed [‡]		12 (6.1)	9 (18.8)	3.58 (1.41–9.07)	2.92 (1.08–7.87)
Stably housed		186 (93.9)	39 (81.3)	Ref	Ref
Socioeconomic status [§]					
Level 1		68 (34.3)	24 (50.0)	1.84 (0.81–4.17)	1.62 (0.69–3.81)
Level 2		32 (16.2)	7 (14.6)	1.14 (0.39–3.29)	0.86 (0.27–2.68)
Level 3		46 (23.2)	7 (14.6)	0.79 (0.28–2.25)	0.76 (0.26–2.22)
Level 4		52 (26.3)	10 (20.8)	Ref	Ref
Depressive symptoms					
Yes		73 (37.4)	19 (40.4)	1.13 (0.59–2.17)	1.01 (0.51–2.01)

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No	122 (62.6)	28 (59.6)	Ref	Ref
Illicit drug use in past year [¶]				
Yes	14 (7.2)	9 (19.2)	3.06 (1.24–7.59)	2.05 (0.76–5.53)
No	181 (92.8)	38 (80.9)	Ref	Ref

Data are presented as No. (%) unless otherwise indicated. Column percentages may not total 100 due to rounding.

* Models include age, race, housing, socioeconomic status, depressive symptoms, and illicit drug use.

[†] Median, interquartile range; odds ratio per 10 years of age.

[‡] Definition includes unstably and dependently housed participants.

[§] Level 1 ($\leq$ high school, unemployed, and $<150\%$ below federal poverty level), Level 2 ($\leq$ high school, unemployed or $<150\%$ below federal poverty level), Level 3 (either $\leq$ high school, unemployed, or $<150\%$ below federal poverty level), and Level 4 ($\geq$ high school education, either employed or $\geq 150\%$ below federal poverty level).

^{||} Center for Epidemiological Studies-Depression Scale (CES-D) ≥ 16 (vs. reference <16).

[¶] Including nonmedical use of cocaine, methamphetamines, other stimulants, opioids, benzodiazepines, barbiturates, or other drugs (eg, hallucinogens, inhalants) in the past year.