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Characteristics of Adults With Diagnosed HIV Who Experienced Housing Instability: Findings From the Centers for Disease Control and Prevention Medical Monitoring Project, United States, 2018

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Abstract

People living with HIV (PLWH) who experience homelessness have poorer clinical outcomes than people with HIV who are not homeless; however, there is limited information on PLWH who experience other forms of housing instability. We used interviews and medical record abstraction data from the Medical Monitoring Project, collected 2018–2019 (N = 4,050), to describe sociodemographic characteristics and clinical outcomes of adults with HIV by whether people experienced unstable housing in the past 12 months. Overall, 21% were unstably housed, of which 55.2% were unstably housed but not homeless. People who were unstably housed were more likely to be younger, have lower educational attainment, be previously incarcerated, live at or below the poverty level, and have poorer mental health and clinical outcomes, independent of homelessness. Interventions to address housing instability, integrated with clinical care, could benefit not just PLWH who are homeless but also those who are unstably housed.

Keywords

antiretroviral therapy; HIV outcomes; homelessness; housing instability; medical monitoring project; unmet needs; viral suppression

Nationwide, approximately 9.5% of people living with HIV (PLWH) experienced homelessness in 2018 (Centers for Disease Control and Prevention [CDC], 2020). PLWH who are experiencing homelessness have worse HIV outcomes, including poorer retention in care, lower adherence to antiretroviral treatment (ART), higher viral load (Aidala et al., 2016; Bowen & Mitchell, 2016; Milloy et al., 2012; Rajabiun et al., 2018), and a greater

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likelihood of death (Schwarcz et al., 2009). People who experience social determinants of poor health, such as poverty, unemployment, lack of health care coverage, history of incarceration, and stigma, are more likely to experience housing instability than people who do not experience social determinants of poor health (Aidala et al., 2016; Baugher et al., 2017; Davila et al., 2018). Moreover, they may be more likely to experience poorer HIV clinical outcomes and comorbidities, such as substance use and mental health disorders (Wainwright et al., 2020) and hepatitis (Stefanovics & Rosenheck, 2019) and tuberculosis (Davy-Mendez et al., 2019) coinfection. The causal direction of these relationships is unclear (Linton et al., 2013; Solomon et al., 2020). However, resources such as Housing Opportunities for People with AIDS (HOPWA) provide housing services for PLWH that can improve clinical outcomes and social determinants of poor health (U.S. Department of Housing and Urban Development, 2021).

Most studies of HIV outcomes among people experiencing homelessness focus on those who are “literally homeless” or “lacking a regular nighttime residence or having a primary nighttime residence that is a temporary shelter or other place not designed for sleeping” (Stewart B. McKinney Homeless Assistance Act, 1987; U.S. Department of Housing and Urban Development, 2011). This narrow definition of homelessness could exclude people who are experiencing other forms of housing instability, such as “couch surfing” or “doubling up,” experiencing frequent moves, or have been evicted and those who transition in and out of literal homelessness. Healthy People 2030 (https://health.gov/healthypeople/objectives-and-data/social-determinants-health/literature-summaries/housing-instability) recognizes the lack of a standard definition of unstable housing while emphasizing the impact of housing instability on health. During the coronavirus disease 2019 (COVID-19) pandemic, housing instability, such as evictions (Himmelstein & Desmond, 2021) and doubling up with friends and relatives, has become more prevalent because of unemployment, reduced wages, or the inability to pay rent; therefore, it is even more important to examine the association between unstable housing and HIV outcomes (Benfer et al., 2021).

Previous analyses (Padilla et al., 2020; Wainwright et al., 2020) have focused on examining social determinants of health and clinical outcomes among PLWH who experienced homelessness, and national estimates of homelessness have been used to inform national HIV prevention strategies. However, there is limited information on characteristics of PLWH using a broader definition of unstable housing that encompasses both homelessness and other forms of unstable housing—such as doubling up or experiencing eviction—and the potential association of unstable housing with HIV outcomes. To build on previous work, we used nationally representative data on adults with diagnosed HIV from the CDC Medical Monitoring Project (MMP; CDC, 2020) to examine sociodemographic and clinical characteristics of PLWH who experienced unstable housing. Because housing instability could include people who experience homelessness, we further examined the association between sociodemographic and clinical factors among people who experienced unstable housing but did not experience homelessness to evaluate associations with unstable housing, independent of homelessness.

Methods

Design and Procedures

The MMP uses a two-stage sampling method to produce nationally representative estimates of behavioral and clinical characteristics among adults with diagnosed HIV in the United States. MMP methods have been previously published (Beer et al., 2019; Johnson et al., 2020). Briefly, in the first stage, 16 states and Puerto Rico were sampled from all 50 states, the District of Columbia, and Puerto Rico. In the second stage, simple random samples of people with diagnosed HIV aged 18 years and older who are living in one of the sampled jurisdictions are drawn from the National HIV Surveillance System (NHSS), a census of all people with diagnosed HIV in the United States. We used data from the 2018 MMP cycle, which included data collected via telephone or in-person interviews and medical record abstractions from June 1, 2018 to May 31, 2019 (CDC, 2020).

All selected jurisdictions participated in the project and included California (including the separately funded jurisdictions of Los Angeles County and San Francisco), Delaware, Florida, Georgia, Illinois (including Chicago), Indiana, Michigan, Mississippi, New Jersey, New York (including New York City), North Carolina, Oregon, Pennsylvania (including Philadelphia), Puerto Rico, Texas (including Houston), Virginia, and Washington. Participating jurisdictions comprise 72% of people with diagnosed HIV in the United States during 2018 (Beer et al., 2019; CDC, 2020). Adjusted for eligibility (i.e., aged 18 years or older, diagnosed with HIV, and living in a sampled MMP jurisdiction), the participant response rate was 45%. Participants received a token of appreciation for their participation.

MMP data collection is considered part of routine public health surveillance and, thus, determined to be nonresearch (CDC, 2010). Participating states or territories obtained local institutional review board approval to collect data when required (Beer et al., 2019). Informed consent was obtained from all participants.

Measures

Data on housing status and other social determinants of health, receipt of HIV care services, ART use, and mental health outcomes were obtained through interviews. Retention in care and viral load data were obtained through medical records abstraction. All data collected were based on the past 12 months, unless otherwise indicated.

Unstable Housing

Homelessness was defined as “living on the street, in a shelter, in a single-room occupancy (SRO) hotel, or in a car” (CDC, 2020). Other forms of unstable housing were defined as moving in with others due to financial issues (also known as doubling up), moving ≥2 times, or being evicted. Persons were considered unstably housed if they had experienced homelessness or any other form of unstable housing. Unstable housing, independent of homelessness, was defined as being unstably housed without experiencing any homelessness.

Other Social Determinants of Health

Poverty was categorized based on the Department of Health and Human Services poverty guidelines as living above or at or below the federal poverty level (U.S. Department of Health and Human Services, 2017). HIV stigma was based on a 10-item Likert scale that measures four dimensions of HIV stigma, including personalized stigma, disclosure concerns, negative self-image, and perceived public attitudes about people with HIV (Wright et al., 2007). Scores ranged from 0 to 100. Variables related to subsistence included the need for and receipt of shelter or housing services and the prevalence of food insecurity. Receipt of shelter or housing services was categorized as needed but not received, received, and did not need and did not receive shelter or housing services.

Clinical Outcomes

Retention in care was defined as having two or more elements of outpatient HIV care (e.g., an encounter with an HIV provider, CD4 test result, or viral load test result, at least 90 days apart in each 12-month period in the 2 years before the interview). ART dose adherence was defined as taking 100% of ART doses during the past 30 days. Sustained viral suppression was defined as having all HIV viral load measurements documented as undetectable or <200 copies/mL in the past 12 months. Symptoms of depression and generalized anxiety disorder were assessed based on the 2 weeks before the interview using the Patient Health Questionnaire-8 (PHQ-8; Kroenke et al., 2009) and the Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006) scales, respectively, and categorized using the recommended cut points.

Statistical Analysis

Among adults with diagnosed HIV (N = 4,050), we examined social determinants of health and clinical outcomes by whether persons were unstably housed. Because of the substantial overlap between homelessness and unstable housing, we also assessed associations with unstable housing independent of homelessness. We reported weighted percentages and 95% confidence intervals (CIs) for categorical variables. Median scores and 95% CIs were reported for continuous measures; non-overlapping CIs were used to assess significant associations between stigma and housing status. We reported prevalence ratios (PRs) with predicted marginal means to assess differences between groups ($p < .05$). Data were weighted based on known probabilities of selection at state or territory and person levels. In addition, data were weighted to adjust for nonresponse and poststratified to known population totals by age, race/ethnicity, and gender from the National HIV Surveillance System (NHSS; Beer et al., 2019). All analyses were conducted using SAS survey procedures (SAS version 9.4; SAS Institute Inc., Cary, NC; 2011) or SAS-callable SUDAAN (version 11.0.3; RTI International, Research Triangle Park, NC).

Results

Of all adults with diagnosed HIV, 21% were unstably housed in the past 12 months (Table 1). Of the PLWH who reported unstable housing, 77.8% (95% CI: 73.4–82.1) had doubled up, 60.0% (95% CI: 55.4–64.5) had moved two or more times, and 14.4% (95% CI: 10.2–18.6) had been evicted in the previous year (not shown in tables). Among the 21% who

experienced housing instability, 55.2% (95% CI: 50.6–59.8) experienced unstable housing, independent of homelessness, 31.6% (95% CI: 27.3–35.9) were homeless and experienced another form of housing instability, and the remaining 13.2% (95% CI: 10.6–15.9) were only homeless without report of other forms of housing instability.

Persons with social determinants of poor health, including lower educational attainment, incarceration, and being at or below the poverty level, were more likely to be unstably housed than persons without social determinants of poor health (Table 2). No differences in housing instability were noted between males and females, although transgender persons were more likely to be unstably housed than males (PR: 1.60, 95% CI: 1.09–2.33). In addition, younger persons and persons who were living with a disability were more likely to experience unstable housing. Persons who were unstably housed also experienced higher levels of HIV stigma (median: 45.0 vs. 36.2) than those who were stably housed. Similar patterns were observed in associations with unstable housing, excluding homelessness.

Persons who were unstably housed were more likely to need but not receive shelter or housing services (PR: 4.94, 95% CI: 4.12–5.92) and more likely to experience food insecurity (PR: 3.76, 95% CI: 3.24–4.36; Table 3). Clinical outcomes for PLWH who were unstably housed were worse than for people who were stably housed. They were less likely to be retained in care (PR: 0.91, 95% CI: 0.85–0.96), less likely to be ART dose adherent (PR: 0.72, 95% CI: 0.65–0.79), and less likely to be virally suppressed (PR: 0.70, 95% CI: 0.65–0.75). PLWH who were unstably housed had more emergency department visits and more hospitalizations than those who were stably housed. PLWH who were unstably housed were more likely to experience symptoms of depression (PR 2.07, 95% CI: 1.72–2.50) and GAD (PR 2.33, 95% CI: 1.96–2.77). Similar associations were observed when comparing clinical outcomes between those who experienced unstable housing without homelessness and those who did not, although the magnitude of the associations was closer to the null.

Discussion

These findings expand our current knowledge about the prevalence of housing instability and differences in characteristics and clinical outcomes by unstable housing among people with HIV. We found that persons who experienced unstable housing experienced more social determinants of poor health and were more likely to experience adverse clinical outcomes than those who did not, independent of experiences with homelessness.

Previous reports (CDC, 2020; Padilla et al., 2020; Wainwright et al., 2020) of MMP data have provided information on the nearly 10% of PLWH who report experiencing literal homelessness in the past 12 months. We found that more than one in five PLWH in the United States experienced homelessness or other forms of unstable housing—indicating a potentially much greater need for housing assistance services than expected based on homelessness estimates alone. Limiting our focus to homelessness alone excludes a substantial portion of PLWH who are experiencing housing instability and may need financial and supportive services essential for addressing challenges with housing.

In this analysis, we provide information on the factors associated with other forms of unstable housing, independent of homelessness which, if left unaddressed, could be a precursor to literal homelessness. Provision of housing services can improve HIV outcomes and social determinants of health among people who are unstably housed, independent of homelessness (Aidala et al., 2016). The “Housing First” model (Padgett et al., 2015), which promotes stable housing as a necessity before provision of social support, including behavioral health services (i.e., for mental health and substance use), has proven effective in linkage to care, improving retention in care, ART adherence, and better clinical outcomes (Aidala et al., 2016). Furthermore, Ryan White HIV/AIDS Programs provide essential services for PLWH to ensure engagement in medical care, linkage to social services, and ART adherence (Weiser et al., 2015, 2021). Integrating housing services with clinical care can further improve HIV outcomes.

The HIV National Strategic Plan aims to reduce homelessness among people with diagnosed HIV by 50% from a 2017 baseline of 9.1% (U.S. Department of Health and Human Services, 2021). Attaining this goal will require a concerted effort to prevent PLWH who are unstably housed from becoming literally homeless. Federal programs that provide emergency assistance or rapid rehousing by paying rent in arrears, or utility bills, or by providing housing vouchers, decrease the risk of eviction, provide permanent supportive housing, and minimize the risk of literal homelessness. Furthermore, programs that provide patient navigators (Sarango et al., 2017), case managers, and funding for health department staff (Lightner et al., 2020) can assist PLWH in providing linkage to housing service providers and improving health outcomes (Clemenzi-Allen et al., 2020). Ryan White HIV/AIDS Program staff with knowledge of community resources can further identify and direct PLWH to supportive housing services, including HOPWA services (U.S. Department of Housing and Urban Development, 2021). Improvement in clinical outcomes will require a concerted effort on the part of clinicians to improve documentation of housing status in medical records. Encouraging the use of standardized definitions of housing status, such as using ICD-10 codes, could provide clinicians with the means to accurately identify people with unmet housing needs (Biederman et al., 2019; National Health Care for the Homeless Council, August 2016).

Similar to data on PLWH who were literally homeless, we found that PLWH who are unstably housed have worse social determinants of health, such as recent incarceration, disability, and poverty, than PLWH who are stably housed (Wainwright et al., 2020). Prevention efforts to alleviate or lessen these factors require a systemic approach that addresses racial inequities, gender biases, stigma, and discrimination. The association between housing instability and behavioral health conditions is well established, yet the bidirectional relationship of housing instability and mental illness or substance use is unclear (Linton et al., 2013; Solomon et al., 2020). Services for PLWH with behavioral health needs and those with housing needs are often siloed; thus, integration of behavioral health services for substance use and mental illness, including depression and GAD, with HIV treatment can improve HIV outcomes for people who are unstably housed (Substance Abuse and Mental Health Services Administration/Health Resources and Services Administration, 2016).

Our study has shown that PLWH who are doubled-up living with family and friends ("couch surfing"), have moved at least two times per year, and have been evicted have poor clinical outcomes, including poor retention in care, ART adherence, or viral suppression. The effect of housing status on HIV clinical outcomes is well documented (Aidala et al., 2016; Rajabiun et al., 2018), and studies that expand our understanding of housing instability can directly affect literal and chronic homelessness among PLWH.

Nearly one third of people who were unstably housed described needing, but not receiving, shelter or housing services, and almost half experienced food insecurity. Although PLWH experiencing homelessness may have access to Ryan White HIV/AIDS program services (Doshi et al., 2017), a large proportion may have unmet needs for behavioral health services, dental care, access to transportation, and housing services (Dray-Spira et al., 2012; Padilla et al., 2020; Wainwright et al., 2020). Interventions to alleviate unmet needs and improve HIV outcomes, such as intensive case management, patient navigators, and financial incentives, have been initiated in a variety of venues (Clemenzi-Allen et al., 2020; Mizuno et al., 2020; Rajabiun et al., 2018; Sarango et al., 2017). These interventions could benefit people who are unstably housed and who may be potentially at risk for literal homelessness. Identifying PLWH who experience housing instability before they become literally homeless could improve their mental health and clinical outcomes. Furthermore, housing interventions need to be sustainable throughout the course of HIV infection to ensure continuity of favorable health outcomes. Because of increased economic instability during the COVID-19 pandemic that could result in an upsurge of people who are unstably housed, additional resources, such as HOPWA funding (U.S. Department of Housing and Urban Development, 2020), are needed for housing assistance to address challenges related to housing stability and homelessness (Benfer et al., 2021; Clemenzi-Allen et al., 2020; Raifman et al., 2021; Tsai & Wilson, 2020).

Limitations

This analysis is not without limitations. First, most of the measures described in this analysis, including unstable housing, were self-reported and may be subject to social desirability bias. Furthermore, because housing stability was ascertained for the 12 months before the interview, we are unable to determine current housing status or to measure timing of periods of homelessness. We are also unable to assess the temporality of housing instability and mental illness and substance use due to the cross-sectional nature of data collection. Also, not all sampled people participated in MMP, but results were adjusted for nonresponse and poststratified to known population totals by age, race/ethnicity, and gender from NHSS using standard methodology. Despite suboptimal response rates, results obtained from unbiased sampling methodology, such as the methodology used in this analysis, have substantial value (Wittwer & Hubrich, 2015).

Conclusions

This study demonstrated that persons who experienced unstable housing had greater levels of social determinants of poor health and were more likely to experience adverse clinical outcomes than those who did not, independent of experiences with homelessness. Given

that unstably housed persons could experience homelessness if housing issues are left unaddressed, these findings emphasize the need to expand definitions of housing instability and increase housing assistance services, integrated with clinical care, to those with the greatest need, particularly given the worsening economic conditions resulting from the COVID-19 pandemic.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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All authors on this article meet the four criteria for authorship as identified by the International Committee of Medical Journal Editors (ICMJE); all authors have contributed to the conception and design of the study, drafted or have been involved in revising the manuscript, reviewed the final version of the manuscript before submission, and agree to be accountable for all aspects of the work. Specifically, using the CRediT taxonomy, the specific contributions of each author is as follows: Conceptualization: R. Marcus, S. Dasgupta, and L. Beer; Data curation and Software: Y. Tie; Formal Analysis: R. Marcus, S. Dasgupta, L. Beer, and Y. Tie; Methodology: S. Dasgupta, L. Beer, M. Padilla, J. Fagan, and J. Prejean; Supervision: J. Prejean; Writing—original draft: R. Marcus, S. Dasgupta, and L. Beer; Writing—review & editing: R. Marcus, Y. Tie, S. Dasgupta, L. Beer, M. Padilla, J. Fagan, and J. Prejean.

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Key Considerations

- People with HIV often experience housing instability (e.g., “doubling up”, moving often, or through eviction) that could affect their clinical outcomes.
- People who are unstably housed may also experience homelessness (e.g., living on the street, in a shelter, or in a car) and they may transition in and out of stable housing.
- Housing instability is often not routinely assessed by clinicians and should be integrated into clinical and behavioral care assessments.
- Social determinants of health, including housing stability, should be incorporated into clinical assessments and documented using standardized measures, such as ICD-10 codes.
- Assessments of housing instability during HIV and behavioral health (e.g., substance use and mental health) care appointments should be used to guide and tailor care services based on individual needs of people with HIV.

Table 1.

Prevalence of Housing Instability Among Persons With Diagnosed HIV—Medical Monitoring Project, United States, 2018 (N = 4,050)

	n	Weighted Row%	95% CI
Unstably housed[a]	870	21.0	19.5–22.6
Experienced unstable housing but not homelessness	471	55.2	50.6–59.8
Experienced homelessness and other forms of unstable housing	272	31.6	27.3–35.9
Experienced homelessness without other forms of housing instability	123	13.2	10.6–15.9

Note. Numbers are unweighted; percentages and corresponding CIs are weighted percentages. CI = confidence interval.

[a]Groups do not total 870 because four people were missing data that would allow for categorization into one of the three mutually exclusive groups described (e.g., person experienced homelessness, but experiences with other forms of housing instability were unknown).

Table 2.

Prevalence of Homelessness and Housing Instability During the Past 12 Months, Overall and by Selected Characteristics, Among Persons With Diagnosed HIV by Sociodemographic Characteristics—Medical Monitoring Project, United States, 2018 (N = 4,050)

	Unstably Housed						Unstably Housed Only (Not Homeless)					
	Yes		No				Yes		No			
Characteristic	*n* [a]	Row% (CI) [b]	*n* [a]	Row% (CI) [b]	PR (95% CI)	*p*	*n* [a]	Row% (CI) [b]	*n* [a]	Row% (CI) [b]	PR (95% CI)	*p*
Total	870	21.0 (19.5–22.6)	3,157	79.0 (77.4–80.5)			471	11.5 (10.0–13.1)	3,552	88.5 (86.9–90.0)		
Gender												
Male	625	20.8 (19.1–22.5)	2,283	79.2 (77.5–80.9)	Reference		335	11.4 (9.8–13.1)	2,571	88.6 (86.9–90.2)	Reference	
Female	219	20.9 (18.5–23.2)	821	79.1 (76.8–81.5)	1.01 (0.88–1.14)	0.937	124	11.3 (9.2–13.4)	914	88.7 (86.6–90.8)	0.99 (0.82–1.18)	0.894
Transgender	26	33.2 (20.4–46.0)	52	66.8 (54.0–79.6)	1.60 (1.09–2.33)	0.027	12	18.7 (8.8–28.7)	66	81.3 (71.3–91.2)	1.64 (0.98–2.74)	0.073
Race/ethnicity												
Black, non-Hispanic	450	25.3 (23.2–27.4)	1,285	74.7 (72.6–76.8)	1.61 (1.37–1.88)	< 0.001	243	13.8 (11.2–16.4)	1,488	86.2 (83.6–88.8)	1.59 (1.30–1.95)	< 0.001
White, non-Hispanic	178	15.7 (13.2–18.3)	944	84.3 (81.7–86.8)	Reference		97	8.7 (6.7–10.7)	1,025	91.3 (89.3–93.3)	Reference	
Hispanic/Latino	169	19.1 (15.3–22.8)	711	80.9 (77.2–84.7)	1.21 (0.93–1.58)	0.157	96	10.8 (8.6–12.9)	784	89.2 (87.1–91.4)	1.24 (0.92–1.67)	0.154
Other/multiracial [c]	73	24.0 (19.6–28.4)	217	76.0 (71.6–80.4)	1.52 (1.24–1.87)	< 0.001	35	12.8 (9.5–16.0)	255	87.2 (84.0–90.5)	1.47 (1.09–1.99)	0.013
Age at the time of interview (year)												
18–29	131	41.5 (35.0–48.0)	206	58.5 (52.0–65.0)	2.83 (2.33–3.44)	< 0.001	75	23.5 (16.4–30.7)	261	76.5 (69.3–83.6)	2.97 (2.09–4.22)	< 0.001
30–39	173	28.1 (24.2–32.0)	427	71.9 (68.0–75.8)	1.91 (1.57–2.33)	< 0.001	100	16.8 (12.6–20.9)	498	83.2 (79.1–87.4)	2.11 (1.56–2.87)	< 0.001
40–49	211	22.7 (19.4–26.0)	675	77.3 (74.0–80.6)	1.55 (1.31–1.82)	< 0.001	106	11.5 (9.3–13.7)	779	88.5 (86.3–90.7)	1.45 (1.20–1.76)	< 0.001
≥50	355	14.7 (13.0–16.4)	1,849	85.3 (83.6–87.0)	Reference		190	7.9 (6.5–9.4)	2,014	92.1 (90.6–93.5)	Reference	
Educational attainment												
Less than high school	218	31.5 (27.6–35.3)	493	68.5 (64.7–72.4)	1.91 (1.67–2.18)	< 0.001	108	14.9 (11.9–17.9)	602	85.1 (82.1–88.1)	1.48 (1.18–1.86)	0.001

Characteristic	Unstably Housed						Unstably Housed Only (Not Homeless)					
	Yes		No				Yes		No			
	n [a]	Row% (CI)[b]	*n* [a]	Row% (CI)[b]	PR (95% CI)	*p*	*n* [a]	Row% (CI)[b]	*n* [a]	Row% (CI)[b]	PR (95% CI)	*p*
High school or equivalent	273	24.0 (20.9–27.1)	811	76.0 (72.9–79.1)	1.46 (1.24–1.71)	<0.001	137	12.5 (10.0–15.1)	946	87.5 (84.9–90.0)	1.25 (1.02–1.53)	0.033
More than high school	379	16.5 (15.0–18.0)	1,851	83.5 (82.0–85.0)	Reference		226	10.0 (8.5–11.6)	2,002	90.0 (88.4–91.5)	Reference	
Sexual behavior or orientation												
Men who have sex with men	373	18.5 (16.5–20.5)	1,566	81.5 (79.5–83.5)	Reference		218	11.2 (9.5–13.0)	1,719	88.8 (87.0–90.5)	Reference	
Men who have sex with women	242	25.7 (22.4–29.1)	668	74.3 (70.9–77.6)	1.39 (1.18–1.63)	< 0.001	112	12.0 (9.2–14.7)	798	88.0 (85.3–90.8)	1.07 (0.83–1.36)	0.616
Women who have sex with men	212	20.7 (18.3–23.1)	805	79.3 (76.9–81.7)	1.12 (0.95–1.31)	0.17	121	11.2 (9.0–13.4)	894	88.8 (86.6–91.0)	1.00 (0.81–1.24)	1
Other	43	26.7 (17.8–35.6)	118	73.3 (64.4–82.2)	1.44 (1.00–2.08)	0.063	20	14.4 (6.8–21.9)	141	85.6 (78.1–93.2)	1.28 (0.75–2.18)	0.376
Incarcerated >24 hr, past 12 months												
Yes	97	49.9 (42.6–57.1)	84	50.1 (42.9–57.4)	2.55 (2.21–2.94)	< 0.001	43	23.2 (16.6–29.8)	137	76.8 (70.2–83.4)	2.12 (1.64–2.74)	< 0.001
No	772	19.6 (18.2–21.0)	3,068	80.4 (79.0–81.8)	Reference		427	11.0 (9.5–12.4)	3,410	89.0 (87.6–90.5)	Reference	
Any disability[d]												
Yes	505	27.1 (24.8–29.3)	1,301	72.9 (70.7–75.2)	1.66 (1.49–1.85)	< 0.001	244	13.4 (11.3–15.4)	1,560	86.6 (84.6–88.7)	1.32 (1.12–1.56)	0.001
No	365	16.3 (14.8–17.9)	1,853	83.7 (82.1–85.2)	Reference		227	10.1 (8.5–11.7)	1,989	89.9 (88.3–91.5)	Reference	
Poverty level, past 12 months[e]												
Above poverty level	305	14.9 (13.0–16.7)	1,750	85.1 (83.3–87.0)	Reference		191	9.4 (7.6–11.2)	1,864	90.6 (88.8–92.4)	Reference	
At or below poverty level	487	28.4 (25.4–31.4)	1,163	71.6 (68.6–74.6)	1.91 (1.62–2.26)	< 0.001	233	13.7 (11.1–16.3)	1,416	86.3 (83.7–88.9)	1.46 (1.12–1.90)	0.006
Median stigma scores	870	45.0 (42.2–47.8)	3,157	36.2 (35.1–37.3)			471	43.9 (40.3–47.6)	3,552	37.1 (36.0–38.2)		

Note. Numbers may not add to total due to missing data. CI = confidence interval; HHS = U.S. Department of Health and Human Services

[a] Numbers are unweighted.

[b] Percentages and corresponding CIs are weighted.

[c] Includes American Indian/Alaska Native, Asian, Native Hawaiian/Other Pacific Islander, or multiple races.

[d] Disability includes physical, mental, and emotional disabilities.

[e] Poverty guidelines as defined by HHS; the 2017 guidelines were used for persons interviewed in 2018 and the 2018 guidelines were used for persons interviewed in 2019. More information regarding HHS poverty guidelines can be found at https://aspe.hhs.gov/frequently-askedquestions-related-poverty-guidelines-and-poverty.

Table 3.

Prevalence of Subsistence Needs and Clinical Outcomes, Overall and by Homeless and Housing Instability During the Past 12 Months Among Persons With Diagnosed HIV—Medical Monitoring Project, United States, 2018 (N = 4,050)

	Unstably Housed						Unstably Housed Only (Not Homeless)					
	Yes		No				Yes		No			
Characteristic[a]	n[b]	Col% (CI)[c]	n[b]	Col% (CI)[c]	PR (95% CI)	p	n[b]	Col% (CI)[c]	n[b]	Col% (CI)[c]	PR (95% CI)	p
Total (row%)	870	21.0 (19.5–22.6)	3,157	79.0 (77.4–80.5)			471	11.5 (10.0–13.1)	3,552	88.5 (86.9–90.0)		
Received shelter or housing services												
Needed but did not receive	255	29.4 (24.9–33.9)	197	6.0 (5.0–6.9)	4.94 (4.12–5.92)	< 0.001	127	26.3 (22.4–30.1)	324	8.9 (7.5–10.2)	2.96 (2.48–3.54)	< 0.001
Received	239	26.0 (22.1–29.9)	468	14.6 (12.6–16.6)	1.78 (1.50–2.12)	< 0.001	85	16.4 (13.0–19.7)	620	17.0 (15.1–19.0)	0.96 (0.80–1.16)	0.676
Did not need and did not receive	367	44.6 (41.1–48.0)	2,473	79.5 (77.3–81.6)	0.56 (0.52–0.60)	< 0.001	258	57.4 (52.9–61.8)	2,581	74.1 (71.9–76.3)	0.77 (0.72–0.83)	< 0.001
Experienced food insecurity												
Yes	402	46.1 (42.7–49.6)	396	12.3 (10.9–13.7)	3.76 (3.24–4.36)	< 0.001	178	38.4 (33.5–43.4)	616	16.8 (15.4–18.2)	2.29 (1.96–2.67)	< 0.001
No	468	53.9 (50.4–57.3)	2,757	87.7 (86.3–89.1)	0.61 (0.57–0.66)	< 0.001	293	61.6 (56.6–66.5)	2,932	83.2 (81.8–84.6)	0.74 (0.68–0.80)	< 0.001
Retained in care												
Yes	651	72.4 (68.0–76.9)	2,567	80.0 (77.8–82.2)	0.91 (0.85–0.96)	< 0.001	360	75.3 (70.2–80.3)	2,856	78.8 (76.7–80.9)	0.96 (0.90–1.02)	0.120
No	173	27.6 (23.1–32.0)	435	20.0 (17.8–22.2)	1.38 (1.16–1.63)	< 0.001	91	24.7 (19.7–29.8)	516	21.2 (19.1–23.3)	1.17 (0.96–1.41)	0.120
ART prescription												
Yes	730	78.3 (75.0–81.6)	2,740	82.0 (79.9–84.1)	0.95 (0.92–0.99)	0.014	406	81.9 (77.4–86.4)	3,061	81.2 (79.1–83.4)	1.01 (0.96–1.06)	0.763
No	140	21.7 (18.4–25.0)	417	18.0 (15.9–20.1)	1.21 (1.04–1.40)	0.014	65	18.1 (13.6–22.6)	491	18.8 (16.6–20.9)	0.96 (0.76–1.22)	0.763
100% ART dose adherence, past 30 days												
Yes	377	45.1 (40.3–49.9)	1,900	62.7 (60.7–64.7)	0.72 (0.65–0.79)	< 0.001	212	45.9 (40.7–51.2)	2,064	61.0 (58.8–63.1)	0.75 (0.68–0.84)	< 0.001
No	411	54.9 (50.1–59.7)	1,130	37.3 (35.3–39.3)	1.47 (1.36–1.59)	< 0.001	222	54.1 (48.8–59.3)	1,319	39.0 (36.9–41.2)	1.38 (1.27–1.51)	< 0.001
Sustained viral suppression[d]												

Characteristic[a]	Unstably Housed						Unstably Housed Only (Not Homeless)					
	Yes		No				Yes		No			
	n[b]	Col% (CI)[c]	*n*[b]	Col% (CI)[c]	PR (95% CI)	*p*	*n*[b]	Col% (CI)[c]	*n*[b]	Col% (CI)[c]	PR (95% CI)	*p*
Yes	441	46.3 (42.4–50.3)	2,248	66.6 (63.8–69.3)	0.70 (0.65–0.75)	< 0.001	261	52.3 (45.9–58.6)	2,425	63.7 (60.8–66.5)	0.82 (0.73–0.92)	< 0.001
No	429	53.7 (49.7–57.6)	909	33.4 (30.7–36.2)	1.61 (1.49–1.73)	< 0.001	210	47.7 (41.4–54.1)	1,127	36.3 (33.5–39.2)	1.31 (1.16–1.49)	< 0.001
Emergency department visits												
0	361	44.7 (40.4–49.0)	1,943	62.1 (59.5–64.6)	0.72 (0.66–0.79)	< 0.001	223	50.0 (44.2–55.7)	2,079	59.6 (57.0–62.1)	0.84 (0.75–0.94)	0.001
1	174	21.0 (17.8–24.2)	580	18.7 (16.9–20.5)	1.12 (0.96–1.30)	0.146	101	22.0 (18.4–25.6)	653	18.9 (16.9–20.8)	1.17 (0.95–1.43)	0.140
2–4	255	26.1 (23.3–28.9)	524	16.1 (14.6–17.6)	1.62 (1.42–1.85)	< 0.001	120	22.8 (18.7–26.9)	658	17.6 (16.1–19.0)	1.30 (1.08–1.57)	0.008
≥5	77	8.2 (6.4–10.1)	103	3.1 (2.4–3.9)	2.62 (1.96–3.50)	< 0.001	25	5.2 (2.4–7.9)	154	4.0 (3.3–4.7)	1.29 (0.77–2.16)	0.341
Hospitalizations												
0	603	72.8 (69.1–76.6)	2,591	82.8 (80.7–84.9)	0.88 (0.83–0.93)	< 0.001	352	77.5 (72.2–82.9)	2,839	81.1 (79.1–83.0)	0.96 (0.89–1.02)	0.168
1	123	13.7 (11.0–16.5)	335	10.7 (8.9–12.5)	1.28 (1.01–1.63)	0.038	68	13.6 (9.5–17.8)	390	11.1 (9.3–12.8)	1.23 (0.87–1.75)	0.245
2–4	118	11.3 (9.0–13.6)	196	5.6 (4.9–6.4)	2.00 (1.57–2.56)	< 0.001	44	7.6 (4.6–10.6)	269	6.7 (6.0–7.5)	1.13 (0.76–1.67)	0.544
≥5	22	2.1 (1.3–2.9)	28	0.9 (0.5–1.3)	2.42 (1.29–4.51)	0.006	__[e]	—	44	1.1 (0.8–1.5)	—	—
Depression, past 2 weeks[f]												
No depression	612	70.2 (66.0–74.4)	2,673	85.6 (84.2–87.0)	0.82 (0.77–0.88)	< 0.001	354	74.8 (70.4–79.1)	2,931	83.4 (82.0–84.8)	0.90 (0.84–0.95)	< 0.001
Major or other depression	242	29.8 (25.6–34.0)	448	14.4 (13.0–15.8)	2.07 (1.72–2.50)	< 0.001	114	25.2 (20.9–29.6)	575	16.6 (15.2–18.0)	1.52 (1.24–1.87)	< 0.001
Generalized anxiety disorder, past 2 weeks[g]												
No or mild anxiety	605	70.3 (66.4–74.1)	2,744	87.2 (84.9–89.5)	0.81 (0.77–0.85)	< 0.001	356	75.5 (70.0–81.0)	2,993	84.8 (82.5–87.0)	0.89 (0.83–0.95)	< 0.001
Moderate to severe anxiety	251	29.7 (25.9–33.6)	387	12.8 (10.5–15.1)	2.33 (1.96–2.77)	< 0.001	112	24.5 (19.0–30.0)	525	15.2 (13.0–17.5)	1.61 (1.29–2.01)	< 0.001

Note. ART = antiretroviral therapy; CI = confidence interval; GAD-7 = Generalized Anxiety Disorder-7.

[a] All variables were self-reported and measured over the past 12 months, except where otherwise indicated.

[b] Numbers are unweighted.

[c] Percentages and corresponding CIs are weighted.

[d] All viral load measurements documented undetectable or <200 copies/mL.

[e] Coefficient of variation ≥0.3. Data suppressed. Estimate is unstable.

[f] Depression was assessed using the Patient Health Questionnaire (PHQ-8); responses to the items on the PHQ-8 were used to define "major depression" and "other depression" according to criteria from the *Diagnostic and Statistical Manual of Mental Disorders, 4th edition* (DSM–IV). "Major depression" was defined as having at least five symptoms of depression; "other depression" was defined as having two to four symptoms of depression. Major depression and other depression were combined into a single category.

[g] Responses to the GAD-7 were used to define "mild anxiety," "moderate anxiety," and "severe anxiety" according to the criteria from the DSM-IV. "Severe anxiety" was defined as having a score of ≥15; "moderate anxiety" was defined as having a score of 10 to 14; and "mild anxiety" was defined as having a score of 5 to 9. For this analysis, no anxiety and mild anxiety were combined into a single category, and moderate anxiety and severe anxiety were combined into a single category.