

SUBSTANCE USE BY PWH IN THE CHAIN STUDY In New York City and the Tri-County Region

Substance use contributes to poor health outcomes for people with HIV/AIDS (PWH) and worsens HIV health disparities. Use of alcohol and drugs – especially hard drugs (heroin and other opiates, cocaine/crack, methamphetamine, and other stimulants) and injection drug use – is associated with poor engagement in HIV care, adherence to antiretroviral (ARV) treatment, and viral suppression (Aidala et al., 2016; Yomogida & Aidala, 2017; Messeri & Sorgi, 2011; Messeri et al., 2019).

This Brief Report is a descriptive analysis of substance use among a community-based probability sample of HIV positive adults in New York City and the Tri-County region of Westchester, Putnam, and Rockland Counties. Patterns of alcohol, marijuana, and/or hard drug use are first described. We then utilize logistic regression to examine substance use and other predictors of engagement with HIV care and health outcomes.

KEY FINDINGS

- A history of problem substance use is widespread among the CHAIN sample – more than half of the study participants have a history of problem drinking and/or hard drug use.
- Rates of current substance use are much lower than ever use. Nonetheless, current problem substance use – problem drinking or hard drug use – is reported by over 1 in five (22%) of NYC and 8% of Tri-County study participants.
- In both NYC and Tri-County, current problem substance use is associated with lower odds of continuous care, adherent ARV use, and viral suppression, controlling for a range of client characteristics (e.g. age, gender, race/ethnicity, education level, income, risk exposure

METHODOLOGY

- Data for analysis were provided by an ongoing study of persons with HIV/AIDS living in NYC and the Tri-County region: the CHAIN Project.
- The original CHAIN sample was designed to be representative of the HIV-positive population receiving medical and/ or social services in NYC or the Tri-County region. https://nyhiv.org/nyhiv-archive/data_chain.html
- This report is based on 873 PWH interviewed from 2015-2020 (621 NYC and 252 Tri-County).
- **Current Problem Drinking:** indicated by the CAGE assessment or drinking weekly, consuming 5+ drinks when drinking.
- **Current Hard Drug Use:** any use of heroin, other opiates, cocaine, crack, methamphetamine, other stimulants in past 6 months.
- **Problem Substance Use:** problem drinking or hard drug use.
- **Injection Drug Use:** any drug injected or skin-popped into a vein, a muscle, or under the skin, with a needle even once.
- **Consistent Care:** no or fewer than 2 missed scheduled HIV medical appointments and no “dropout” episodes for 6+ months.
- **Adherent ARV Use:** not missing any dose in past 2 days and taking ARV medication “exactly as prescribed, never missing a dose.”

group, insurance status, and year of HIV diagnosis), and other service needs and services received.

STUDY SAMPLE

Data for this study were obtained from in-person interviews completed between 2015-2020 with 873 NYC CHAIN cohort members in New York City (621) and the Tri-County Region (252). Study participants in NYC include 215 PWH originally recruited in 2009-11 and 406 recruited in 2015 or later. The later recruitment period was limited to PWH under age 40. Tri-County participants were recruited using a repeated cross-sectional design without a focus on younger individuals.

More than one-third of the NYC sample is under age 35 years with nearly twice the number of men than women. The Tri-County sample is older (70% age 50+) with a more even distribution between men and women (Table 1). Given gender and especially age differences in study samples, caution should be exercised when comparing NYC and Tri-County differences in substance use patterns. For most substances, use decreases with age, and at every age, men have higher rates of problem use than women (SAMHSA, 2021). Most study participants identified as Black or Hispanic/Latinx.

PATTERNS OF SUBSTANCE USE

Lifetime Patterns of Use. Almost all study participants have ever used alcohol and rates of current use remain high in both NYC (64%) and Tri-County (70%). Rates of ever using cocaine/crack (NYC: 39%; Tri-County: 40%) and using heroin or other opiates (NYC: 12%; Tri-County: 17%) are comparable between the two locations; however, current substance use, regardless of type, was reported by a greater number of respondents in NYC than the Tri-County region. Rates of current use of marijuana, cocaine/crack, and methamphetamine or other stimulants were more than twice as high in NYC relative to the Tri-County (Table 2).

Problem Substance Use. Table 3 presents a number of indicators of recurrent patterns of substance use associated with increased risk for health or psychosocial problems or impairment. Relatively few respondents screen positive for problem drinking (NYC: 11%; Tri-County: 6%). History of hard drug use is higher in the Tri-County, while current use is substantially higher in NYC. Compared to earlier in the HIV epidemic, rates of current injection drug use are very low; no Tri-County respondents currently report needle use (Aidala, Weinberg, & Ho, 1997). A multi-item indicator of *problem substance use* was created based on any of the following: current problem drinking, or current use of cocaine/crack, heroin or other opiates, methamphetamine or other stimulants, or injecting drug use.¹ More than one-third of CHAIN participants in both NYC and Tri-County have a history of problem substance use but rates of current problem use is much higher in NYC (22%). Regular use of marijuana is not included in the summary measure of *problem substance use* since regular use of marijuana is not necessarily associated with impairment or other problems. Nonetheless, community surveillance data has shown some correlation between daily or near daily marijuana use and mental health symptoms and other negative outcomes, warranting further investigation of subgroups who may be at risk (NIDA, 2020).

Frequency of Use among Problem Substance Users. Polysubstance use is common. Study participants classified as problem substance users (defined above) are often active users of multiple types of drugs. Tables 4 & 5 and Figures 1 & 2 show frequency of use of specific substances among current problem substance users. While rates of problem substance use are lower in Tri-County than in NYC, current problem drinkers in the Tri-County used alcohol more frequently, with 65% reporting

¹ No cases were added to the Problem Substance Use classification based on injecting drug use alone.

drinking weekly or more often compared to 39% of NYC respondents. The same pattern is seen for frequency of cocaine/crack, and heroin/opiate use among problem substance users –rates of weekly use are higher among Tri-County study participants than in NYC. However, these findings should be interpreted with caution due to the low case base for current problem substance users among Tri-County CHAIN participants.

Substance Use by Sociodemographics. The general pattern from these data is that rates of current problem drinking and current hard drug use are higher among younger respondents (18-34 years), although in NYC, rates of hard drug use are comparable among those older (35-49 years) (Table 6). Problem drinking and hard drug use are more commonly reported by men than women and among respondents experiencing unstable housing or homelessness. Rates of problem drinking are highest among Hispanic and Black respondents; current hard drug use is most common among NonHispanic Whites.

In both NYC and the Tri-County, higher percentages of NonHispanic Whites and older (age 50+) CHAIN participants to report a history of IDU relative to other races/ethnicities and age groups, but very few respondents currently use needles for any substance (Table 7). When considering the composite measure of problem substance use, rates are lowest among the older PWH and comparable between other age groups. In both locations, more men than women have a history of problem substance use and a higher percentage are current problem substance users. Rates of current problem substance use are also higher among persons who are unstably housed/homeless.

SUBSTANCE USE AND SELECT OUTCOMES

Problem Drinking: Low mental health functioning scores were more common among problem drinkers. Although the majority of problem drinkers reported consistent engagement in HIV care, 36% missed two or more HIV care appointments in the past 6 months in NYC, as did 27% of respondents in the Tri-County. Similarly, while the majority of problem drinkers reported adherent ARV use, about one-third in both locations reported they were not adherent. At least 15% of current problem drinkers in NYC were not virally suppressed (Table 9). In the Tri-County, where the number of current problem drinkers is low, 17% were not virally suppressed (Table 11).

Marijuana Use: Low mental health functioning scores were more common among people who use marijuana. Current users, in comparison to non-users and former users have lower mental health functioning scores (Tables 9 & 11).

Problem Substance Use: More than two-thirds of current problem substance users in NYC and more than half in the Tri-County have low mental health functioning scores, as do current injection drug users (Tables 10 & 12).² Participants who report any current use or history of injection drug use also report poorer health outcomes: more missed appointments or period(s) of dropping out of care, less adherent ARV treatment, and less viral suppression. (Tables 10 & 12).

The associations between problem substance use and HIV care continuum outcomes were examined in a prior CHAIN report (Aidala & Yomogida, 2019). These analyses used an expanded, overtime data set composed of multiple interviews with NYC CHAIN participants gathered from 2002-2015. To examine the associations between problem substance use and HIV medical care outcomes, a series of multiple random effects logistic regression models were used, adjusting for correlation among

² No Tri-County respondent reported current injection drug use.

repeated observations on individuals and controlling for other service needs, receipt of drug treatment as well as supportive services to address co-occurring needs, and demographic and other covariates (e.g., age, gender, race/ethnicity, education level, income, risk exposure group, insurance status, and year of HIV diagnosis).

Current problem substance use is associated with lower odds of consistent care, entry into consistent care after a period of multiple missed appointments or dropping out of care, and sustained consistent care over multiple interview periods (Table 13). The same pattern is seen in the series of analyses showing the negative association of current problem substance use and adherent ARV use (Table 14). Current problem substance use is the strongest predictor of failure to achieve viral suppression, entry into suppressed viral load after a period of being unsuppressed, or to sustain viral suppression over multiple interviews (Table 15).

Briefing Report prepared by

Angela Aidala, Maiko Yomogida, Erin Harned, and Molly Dorshimer
Mailman School of Public Health, Columbia University

Submitted: 01/04/2022

Published/Posted: 04/19/2022

Table 1. Sample Characteristics

		NYC (n=621)	Tri-County (n=252)
Age	<35	37%	11%
	35-49	33%	19%
	50+	30%	70%
Gender	Female	34%	52%
	Male	64%	48%
	Transgender ¹	2%	<1%
Race/ Ethnicity	White	5%	6%
	Black	50%	53%
	Hispanic/Latinx	39%	37%
	Other ²	6%	4%
Housing Status³	Stable	71%	88%
	Unstable	14%	10%
	Homeless	15%	1%
Poverty Level Income ⁴	Above Poverty	40%	52%
	Below Poverty	60%	48%
Education	Less than High School	33%	38%
	High School	49%	43%
	More than High School	18%	19%
Borough/ County	Bronx	39%	--
	Brooklyn	28%	--
	Manhattan	19%	--
	Queens	9%	--
	Staten Island	5%	--
	Westchester	--	80%
	Putnam or Rockland	--	20%

¹ Sample includes too few transgender respondents for reliable estimates (n<20).

² Other includes respondents who identified as Asian, Native American, mixed, or another racial or ethnic identify.

³ Unstably housed respondents are in a transitional housing program or residential treatment or temporarily doubled up with others in someone else’s home. Homeless are on the street or another place not intended for sleeping, in a homeless shelter, limited stay SRO, or welfare hotel.

⁴ Above or below the U.S. Census Poverty Threshold calculated by household composition and household income.

Table 2. Patterns of Substance Use

		NYC (n=621)	Tri-County (n=252)
Alcohol use	Never ¹	10%	15%
	Past ²	26%	15%
	Current ³	64%	70%
Marijuana	Never	44%	53%
	Past	21%	35%
	Current	35%	12%
Cocaine/Crack	Never	61%	59%
	Past	28%	38%
	Current	11%	4%
Heroin/Other Opiates⁴	Never	88%	83%
	Past	9%	15%
	Current	3%	2%
Methamphetamine/Stimulants⁴	Never	86%	96%
	Past	8%	4%
	Current	6%	1%

1. "Never" refers to never at all or only experimental use- few sips or taste of alcohol or used drug fewer than 5 times.

2. "Past" refers to lifetime use but not within the past six months.

3. "Current" refers to using currently or within the past six months.

4. Other opiates or stimulants used without a prescription or more or for longer than prescribed.

Table 3. Indicators of Problem Substance Use

		NYC (n=621)	Tri-County (n=252)
Current Problem Drinking¹		11%	6%
Current Marijuana Use 3+ times weekly²		21%	6%
Hard Drug Use³	Never	58%	57%
	Past	26%	39%
	Current	15%	4%
Injection Drug Use⁴	Never	88%	84%
	Past	9%	16%
	Current	3%	0%
Problem Substance Use⁵	Never	46%	54%
	Past	32%	38%
	Current	22%	8%

1. Current problem drinking based on CAGE (Ewing, 1984) index or drinking weekly, consuming 5+ drinks when drinking.

2. Current marijuana/ hashish three times a week or more often.

3. Cocaine/crack, heroin or other opiates, methamphetamine or other stimulants.

4. Drug injected or skin popped into a vein, into a muscle, or under the skin, with a needle, even one time

5. Cocaine/crack, heroin or other opiates, methamphetamine or other stimulants OR problem drinking.

5. Drug injected or skin popped into a vein, into a muscle, or under the skin, with a needle, even one time

Table 4. Frequency of Alcohol and Marijuana Use among Problem Substance Users¹

	Frequency of use	NYC (n=136)	Tri-County² (n=20)
Alcohol	Limited or None ³	55%	30%
	Monthly	6%	5%
	1-3 Times/Week	32%	50%
	Daily	7%	15%
Marijuana	Limited or None	54%	65%
	Monthly	6%	5%
	1-3 Times/Week	19%	25%
	Daily	21%	5%

1. Frequency of current alcohol/ marijuana use among persons also reporting use of cocaine/crack, heroin or other opiates, methamphetamine or other stimulants, or problem drinking, past six months.

2. Insufficient number of observations for reliable estimates (n<25).

3. Limited or none = 0-5 uses in the past six months

Table 5. Frequency of Hard Drug Use among Problem Substance Users¹

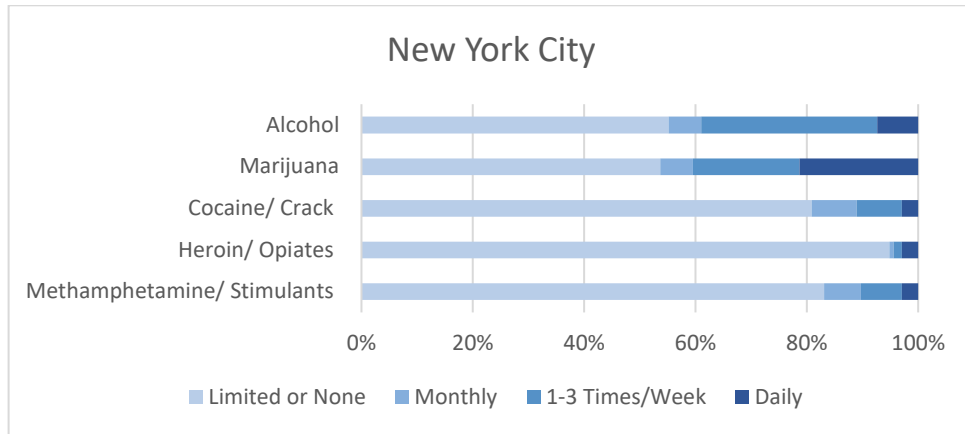
	Frequency of use	NYC (n=136)	Tri-County² (n=20)
Cocaine/Crack	Limited or None ³	81%	60%
	Monthly	8%	15%
	1-3 Times/Week	7%	20%
	Daily	3%	5%
Heroin/Opiates	Limited or None	95%	90%
	Monthly	1%	0%
	1-3 Times/Week	1%	5%
	Daily	3%	5%
Methamphetamine/Stimulants	Limited or None	83%	95%
	Monthly	7%	5%
	1-3 Times/Week	7%	0%
	Daily	3%	0%

1. Frequency of current use of specific drugs among persons reporting use of cocaine/crack, heroin or other opiates, methamphetamine or other stimulants, or problem drinking past six months.

2. Insufficient number of observations for reliable estimates (n<25).

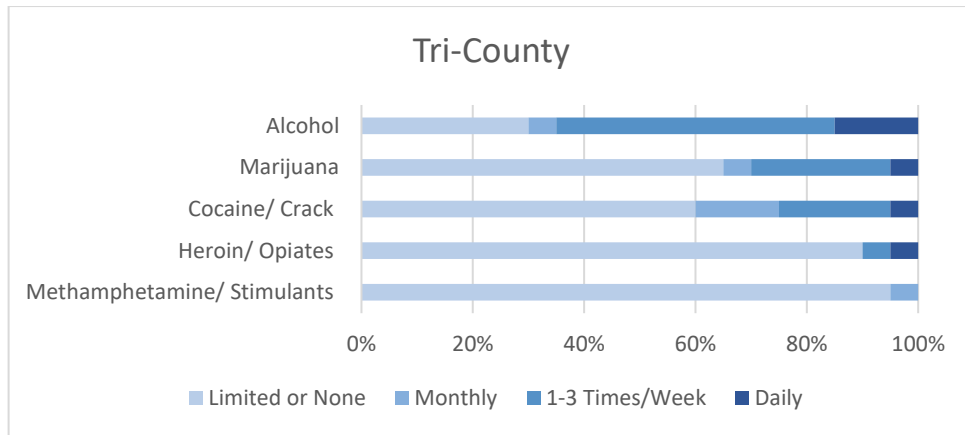
3. Limited or none = 0-5 uses in the past six months

Figure 1. Frequency of Substances Used among Problem Substance Users (NYC)



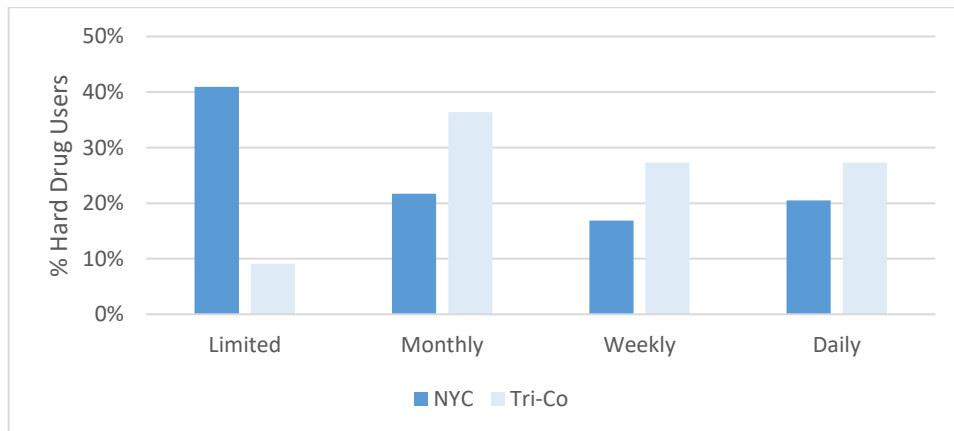
NYC n=136; Limited or None = 0-5 uses in the past six months
 Frequency of alcohol is only given if the respondent is a current problem drinker.

Figure 2. Frequency of Substances Used among Problem Substance Users (Tri-County)



Tri-County n=20, insufficient number of observations for reliable estimates
 Limited or None = 0-5 uses in the past six months

Figure 3. Highest Frequency of Hard Drug Use among Current Hard Drug Users



NYC n=83; Tri-County n=11, insufficient number of observations for reliable estimates
 Limited or None = 0-5 uses in the past six months

Table 6. Current Problem Drinking and Hard Drug Use by Sociodemographics

		NYC		Tri-County	
		Current Problem Drinking	Current Hard Drug Use	Current Problem Drinking	Current Hard Drug Use
Overall		11%	15%	6%	4%
Age	<35	13%	15%	19%	15%
	35-49	11%	20%	4%	4%
	50+	8%	11%	5%	3%
Gender¹	Female	8%	8%	5%	3%
	Male	12%	19%	8%	6%
Race/ Ethnicity	White	3%	33%	0%	0%
	Black	10%	15%	5%	3%
	Hispanic/Latinx	13%	13%	10%	8%
	Other ²	5%	21%	0%	0%
Housing Status	Stable	9%	12%	4%	4%
	Unstable	15%	20%	15%	12%
	Homeless	14%	29%	33%	0%
Poverty Level Income	Above	10%	12%	9%	7%
	Below	10%	18%	2%	2%
Borough/ County	Bronx	10%	18%	--	--
	Brooklyn	7%	14%	--	--
	Manhattan	12%	15%	--	--
	Queens	14%	11%	--	--
	Staten Island	22%	16%	--	--
	Westchester	--	--	7%	5%
	Putnam or Rockland	--	--	4%	2%

Note: Row percentages shown

¹ Too few transgender individuals for reliable estimates.

² Respondents who identified as Asian, Native American, mixed, or another race/ethnic category.

Table 7. Problem Substance and Injection Drug Use by Sociodemographics: NYC

		Problem Substance Use			Injection Drug Use		
		Never	Past	Current	Never	Past	Current
Overall		46%	32%	22%	88%	9%	3%
Age	<35	58%	18%	24%	90%	5%	5%
	35-49	48%	27%	26%	92%	5%	4%
	50+	30%	55%	16%	82%	18%	1%
Gender¹	Female	57%	31%	12%	91%	7%	1%
	Male	41%	32%	27%	86%	10%	4%
Race/ Ethnicity	White	30%	37%	33%	72%	24%	3%
	Black	47%	31%	21%	90%	8%	2%
	Hispanic/Latinx	46%	32%	22%	88%	8%	4%
	Other ²	47%	29%	24%	84%	11%	5%
Housing Status	Stable	49%	33%	18%	89%	10%	2%
	Unstable	40%	31%	29%	92%	6%	2%
	Homeless	39%	28%	33%	83%	8%	10%
Poverty Level Income	Above	46%	35%	19%	89%	9%	1%
	Below	48%	28%	24%	88%	8%	4%
Borough	Bronx	48%	28%	24%	88%	8%	6%
	Brooklyn	50%	33%	18%	89%	9%	2%
	Manhattan	39%	40%	22%	88%	11%	2%
	Queens	54%	25%	21%	89%	7%	4%
	Staten Island	31%	41%	28%	88%	13%	0%

Note: Row percentages shown.

¹ Too few transgender individuals for reliable estimates.

² Respondents who identified as Asian, Native American, mixed, or another race/ethnic category.

Table 8. Problem Substance Use and Injection Drug Use by Sciodemographics: Tri-County

		Problem Substance Use			Injection Drug Use		
		Never	Past	Current	Never	Past	Current
Overall		46%	32%	22%	88%	9%	0%
Age	<35	74%	4%	22%	100%	0%	--
	35-49	65%	27%	8%	98%	2%	--
	50+	47%	47%	6%	78%	22%	--
Gender¹	Female	57%	36%	7%	89%	11%	--
	Male	49%	42%	9%	79%	21%	--
Race/ Ethnicity	White	56%	44%	0%	88%	13%	--
	Black	51%	43%	6%	81%	19%	--
	Latinx	55%	32%	13%	88%	11%	--
	Other ²	70%	30%	0%	89%	11%	--
Housing Status	Stable	54%	39%	7%	83%	17%	--
	Unstable	58%	27%	15%	92%	8%	--
	Homeless ³	0%	67%	33%	100%	0%	--
Poverty Level Income	Above	56%	33%	12%	88%	12%	--
	Below	51%	45%	4%	80%	20%	--
County	Westchester	49%	42%	9%	81%	19%	--
	Putnam or Rockland	73%	22%	4%	96%	4%	--

Note: Row percentages shown

¹ Too few transgender individuals for reliable estimates.

² Respondents who identified as Asian, Native American, mixed, or another race/ethnic category.

Table 9. Problem Drinking, Marijuana Use, and Selected Outcomes (NYC)

		Total	Problem Drinking		Marijuana Use	
			Current	Never	Past	Current
	n=	620	66	274	131	216
Mental Health Functioning¹	High	44%	30%	47%	53%	35%
	Low	56%	70%	53%	47%	65%
Physical Health Functioning²	High	56%	59%	56%	49%	60%
	Low	44%	41%	44%	51%	40%
HIV Care	Consistent Care	77%	64%	82%	81%	69%
	Missed 2+ Appts	23%	36%	18%	19%	31%
Adherent ARV Use	Yes	79%	68%	82%	87%	72%
	No	21%	32%	18%	13%	28%
HIV Viral Load	Suppressed	90%	85%	94%	87%	90%
	Unsuppressed	10%	15%	6%	13%	10%

¹ Mental Component Summary Score (MCS) <42.0 on MOS-SF36 indicating clinically significant mental health symptoms.

² Physical Component Summary Score (PCS) <50.0 on MOS-SF36, indicating some health functioning limitations.

Table 10. Problem Substance Use, Injection Drug Use, and Selected Outcomes (NYC)

		Problem Substance Use			Injection Drug Use		
		Never	Past	Current	Never	Past	Current ¹
	n=	287	197	139	542	54	19
Mental Health Functioning²	High	47%	49%	32%	44%	54%	16%
	Low	53%	51%	68%	56%	46%	84%
Physical Health Functioning³	High	60%	49%	58%	57%	43%	58%
	Low	40%	51%	42%	43%	57%	42%
HIV Care	Consistent Care	81%	82%	60%	78%	81%	47%
	Missed 2+ Appts	19%	18%	40%	22%	19%	53%
Adherent ARV Use	Yes	81%	85%	68%	80%	87%	42%
	No	19%	15%	32%	20%	13%	58%
HIV Viral Load	Suppressed	93%	91%	87%	91%	92%	83%
	Unsuppressed	6%	9%	13%	9%	8%	17%

¹ Insufficient number of observations for reliable estimates (n<25).

² Mental Component Summary Score (MCS) <42.0 on MOS-SF36 indicating clinically significant mental health symptoms.

³ Physical Component Summary Score (PCS) <50.0 on MOS-SF36, indicating some health functioning limitations.

Table 11. Problem Drinking, Marijuana Use, and Selected Outcomes (Tri-Country)

		Total	Problem Drinking Current ¹	Marijuana Use		
				Never	Past	Current
	n=	252	15	134	87	31
Mental Health Functioning²	High	58%	40%	60%	61%	42%
	Low	42%	60%	40%	39%	58%
Physical Health Functioning³	High	45%	53%	51%	32%	52%
	Low	55%	47%	49%	68%	48%
HIV Care	Consistent Care	89%	73%	90%	91%	81%
	Missed 2+ Appts	11%	27%	10%	9%	19%
Adherent ARV Use	Yes	84%	67%	84%	85%	87%
	No	16%	33%	16%	15%	13%
HIV Viral Load	Suppressed	94%	83%	97%	93%	89%
	Unsuppressed	6%	17%	3%	7%	11%

¹Insufficient number of observations for reliable estimates (n<25).

² Mental Component Summary Score (MCS) <42.0 on MOS-SF36 indicating clinically significant mental health symptoms.

³ Physical Component Summary Score (PCS) <50.0 on MOS-SF36, indicating some health functioning limitations.

Table 12. Problem Substance Use, Injection Drug Use, and Selected Outcomes (Tri-County)

		Problem Substance Use			Injection Drug Use		
		Never	Past	Current ¹	Never	Past	Current
	n=	135	96	20	211	39	0
Mental Health Functioning²	High	60%	58%	45%	57%	64%	--
	Low	40%	42%	55%	43%	36%	--
Physical Health Functioning³	High	49%	38%	55%	48%	28%	--
	Low	51%	63%	45%	52%	72%	--
HIV Care	Consistent Care	93%	89%	70%	90%	90%	--
	Missed 2+ Appts	7%	11%	30%	10%	10%	--
Adherent ARV Use	Yes	86%	86%	65%	86%	82%	--
	No	14%	14%	35%	14%	18%	--
HIV Viral Load	Suppressed	94%	94%	88%	94%	94%	--
	Unsuppressed	6%	6%	13%	6%	6%	--

¹Insufficient number of observations for reliable estimates (n<25).

² Mental Component Summary Score (MCS) <42.0 on MOS-SF36 indicating clinically significant mental health symptoms.

³ Physical Component Summary Score (PCS) <50.0 on MOS-SF36, indicating some health functioning limitations.

Table 13. Substance Use, Treatment, and Consistent Care (NYC)

	Consistent Care	Entry into Consistent Care	Sustained Consistent Care
Current Problem Substance Use	0.260***	0.417*	0.215***
Past Problem Substance Use	0.528***	0.803	0.503**
AOD Treatment or Services	0.882	1.054	1.027
Low Mental Health Functioning	0.691***	0.887	0.529***
Mental Health Services	0.936	0.909	0.977
Housing Needs	0.730**	0.864	0.717*
Housing Assistance	0.976	1.192	0.926
Medical Case Management	1.214	1.316	1.027
Social Service Case Management	1.048	1.020	0.884

AOR adjusted odds ratio; * p < .05; ** p < .01; *** p < .001

Note: Analysis based on over time data including individuals with multiple interviews completed 2009-2018. Logistic regression equations using random effects procedure to adjust for the dependency among multiple observations contributed by the same individual. The first model examines predictors of continuous care (n= 845 respondents, 3,555 observation points). Model 2 examines predictors of entry into continuous care among respondents who were not in continuous care the previous interview period (n=377 respondents not in continuous care at one or more interview periods, 688 observation points). Model 3 examines sustained continuity of care at successive interviews (n=694 respondents with over time data; 2,083 observation points). All models control for food and transportation needs and services, age, gender, race/ethnicity, education, income, risk exposure group, insurance status, and year of HIV diagnosis.

Table 14. Substance Use, Treatment, and Adherent ARV Use (NYC)

	Adherent ARV Use	Entry into Adherent ARV Use	Sustained Adherent ARV Use
Current Problem Substance Use	0.326***	0.531*	0.313***
Past Problem Substance Use	0.766	1.175	0.626**
AOD Treatment or Services	0.812	0.850	0.907
Low Mental Health Functioning	0.878	1.050	0.846
Mental Health Services	1.181	1.509*	1.019
Housing Needs	0.583***	0.622**	0.620***
Housing Assistance	1.438*	1.333	1.538*
Medical Case Management	1.046	1.341	0.974
Social Service Case Management	1.247	1.485*	1.179

AOR adjusted odds ratio; * p < .05; ** p < .01; *** p < .001

Note: Analysis based on over time data including individuals with multiple interviews completed 2009-2018. Logistic regression equations using random effects procedure to adjust for the dependency among multiple observations contributed by the same individual. The first model examines predictors of adherent ARV use (n= 846 respondents, 3,560 observation points). Model 2 examines predictors of entry into adherent ARV among respondents who were not in adherent ARV users in the previous interview period (n=516 respondents not adherent at one or more interview periods, 2,078 observation points). Model 3 examines sustained adherent ARV use at successive interviews (n=709 respondents with over time data; 2,083 observation points). All models control for food and transportation needs and services, age, gender, race/ethnicity, education, income, risk exposure group, insurance status, and year of HIV diagnosis.

Table 15. Substance Use, Treatment, and Viral Suppression (NYC)

	Suppressed Viral Load	Entry into Suppressed Viral Load	Sustained Suppressed Viral Load
Current Problem Substance Use	0.220***	0.308***	0.271***
Past Problem Substance Use	0.511**	0.622	0.768
AOD Treatment or Services	0.564***	0.916	0.492
Low Mental Health Functioning	0.825	1.030	0.796
Mental Health Services	1.222	1.312	1.077
Housing Needs	0.643***	0.706	0.624**
Housing Assistance	1.510*	1.034	1.445
Medical Case Management	0.820	0.936	0.752
Social Service Case Management	0.874	0.906	0.743

AOR adjusted odds ratio; *p < .05 **p < .01 ***p < .001

Note: Analysis based on over time data including individuals with multiple interviews completed 2009-2018. Logistic regression equations using random effects procedure. Predictors of viral suppression (n= 829 respondents, 3,331 observation points). Entry into viral suppression among respondents not suppressed the previous interview period (n=391 respondents, 750 observation points). Sustained viral suppression at successive interviews (n=699 respondents with over time data; 2,144 observation points). All models control for food and transportation need and services, and client age, gender, race/ethnicity, education, income, risk exposure group, insurance status, and year of HIV diagnosis.

Literature Cited

- Aidala, A., Weinberg, G., & Ho, J. (1997). Substance Use and Needs for Alcohol and Drug Services Among Persons Living with HIV/AIDS in New York City. C.H.A.I.N. 1997-8 Report. Available at <https://nyhiv.org/nyhiv-archive/pdfs/chain/CHAIN%201997-8%20Report%20Substance%20Use%20and%20Needs%20For%20Alcohol%20and%20Drug%20Services%20Among%20Persons%20Living%20With%20HIV-AIDS%20in%20New%20York%20City.pdf>.
- Aidala, A. & Yomogida, M. (2019). Housing Need, Housing Assistance, and Engagement with HIV Medical Care. C.H.A.I.N. 2018-2 Report. Available at <https://nyhiv.org/nyhiv-archive/pdfs/chain/CHAIN%20Report%202018-2%20Housing%20Need%20Housing%20Assistance%20and%20Engagment%20with%20HIV%20Medical%20Care.pdf>.
- Aidala, A., Yomogida, M., Lunden, S., Sharma, N., & Vardy, Y. (2016). Delayed Entry in HIV Care in New York City and the Tri-County. C.H.A.I.N. 2012-1 Report. Available at <https://nyhiv.org/nyhiv-archive/pdfs/chain/CHAIN%202012-1%20Delayers%20Aug042016.pdf>.
- Messeri, P., Carmody, K., & Penrose, Katherine. (2019). Determinants of Viral Suppression in the CHAIN Cohort. C.H.A.I.N. 2017-2 Report. Available at <https://nyhiv.org/wp-content/uploads/2020/01/CHAIN-Report-2017-2-Viral-Suppression-final.pdf>.
- Messeri, P. & Sorgi, A. (2011). Determinants of HAART Use and Adherence. C.H.A.I.N. 2011-4 Report. Available at [https://nyhiv.org/nyhiv-archive/pdfs/chain/CHAIN%202011-4%20Brief%20Report%20determinants%20of%20HAART%20adherence\(2\)%20DOHMH%20final.pdf](https://nyhiv.org/nyhiv-archive/pdfs/chain/CHAIN%202011-4%20Brief%20Report%20determinants%20of%20HAART%20adherence(2)%20DOHMH%20final.pdf).
- National Institute on Drug Abuse (NIDA). (2020). Marijuana Research Report. National Institute on Drug Abuse. Retrieved from <https://nida.nih.gov/download/1380/marijuana-research-report.pdf?v=d9e67cbd412ae5f340206c1a0d9c2bfd>.
- Substance Abuse and Mental Health Services Administration (SAMHSA). (2021). 2020 National Survey on Drug Use and Health Detailed Tables. Substance Abuse and Mental Health Services Administration. Retrieved from <https://www.samhsa.gov/data/report/2020-nsduh-detailed-tables>.
- Yomogida, Y. & Aidala, A. (2017) Dropping Out of HIV Medical Care. C.H.A.I.N. 2015-4 Report. Available at <https://nyhiv.org/nyhiv-archive/pdfs/chain/CHAIN%202015-4%20Dropouts%20final%20Aug07.pdf>.