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Cigarette smoking and drug use among a nationally representative sample of HIV-positive individuals

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Abstract

Background and objectives—Among HIV-positive populations, the prevalence of cigarette smoking remains disproportionately high and is associated with significant morbidity and mortality. Little is known about this topic among HIV-positive persons in the general population.

Methods—Data came from the 2005–2011 National Survey on Drug Use and Health (NSDUH) public use data files. Unadjusted and adjusted multinomial logistic regression analyses explored the associations between sociodemographic, drug and alcohol use, and drug and/or alcohol treatment characteristics with smoking status among HIV-positive individuals (n=349).

Results—More than 40% of the sample was current smokers. In adjusted analyses, females (aRRR=0.11, 95% CI=0.03–0.41) and participants who had never been married (aRRR=0.19, 95% CI=0.05–0.58), were more likely to be former smokers than never smokers. Females (aRRR=0.37, 95% CI=0.14–0.96) and individuals older than age 35 (aRRR=0.37, 95% CI=0.16–0.89) were less likely to be current smokers than never smokers. Conversely, previously married persons (aRRR=5.72, 95% CI=1.40–23.31), participants reporting binge drinking (aRRR=5.96, 95% CI=2.27–15.64), and lifetime drug or alcohol treatment (aRRR=5.12, 95% CI=2.09–12.55) were more likely to be current smokers than never smokers.

Conclusions—Findings help confirm the high prevalence of smoking among HIV-positive persons suggesting the need for integrated substance use and smoking cessation treatment among HIV-positives.

Scientific significance—The present findings have implications for the development and implementation of targeted smoking cessation programs for HIV-positive smokers.

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Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this paper.

Introduction

Despite the declining prevalence of smoking in the United States,¹ cigarette smoking is still highly prevalent among HIV-positive populations—three times greater than what is observed in the general population (approximately 50–70% versus 20%),^{2–7} respectively. The preponderance of smoking in HIV-positive populations contributes to a variety of deleterious health and treatment outcomes. For instance, elevated risks of chronic obstructive pulmonary disease (COPD),⁸ lung cancer,⁹ and cardiovascular disease⁸ have been observed in this group. In fact, lung cancer is the third most commonly diagnosed cancer among persons with HIV/AIDS.⁹ Furthermore, HIV-positive smokers lose more life-years to cigarette smoking than they do to HIV.¹⁰ Additionally, a study of women on highly active antiretroviral therapy (HAART) found that cigarette smokers had poorer viral and immunologic responses, greater risk of virologic rebound, more frequent immunologic failure, and have a higher risk of developing AIDS than non-smokers.^{11,12}

Prior research has explored factors and characteristics associated with cigarette smoking among individuals with HIV in restricted samples. These include demographic factors such as sex,⁴ age,³ race/ethnicity,³ and education^{3,13} as well as behavioral factors like heavy drinking and illegal drug use.³ The latter two factors add an additional layer of complexity to the issue, since smoking, drug use, and HIV tend to be comorbid with one another, often with ill effects. Cigarette smoking among substance users is associated with adverse health outcomes and increased mortality,^{14,15} and cigarette smoking is associated with poor HIV treatment outcomes.¹² Furthermore, untreated substance use disorders can result in poor HIV treatment outcomes.¹⁶ Therefore it is critical to understand associations between cigarette smoking and drug use in HIV-positive populations.

Though research examining the intersecting fields of smoking and HIV/AIDS has expanded in recent years, gaps in the literature are still evident. For instance, the majority of extant research has focused on clinic- or community-based samples. There has been little examination of smoking characteristics among HIV-positive populations at a national level. One notable exception is a study conducted by Collins and colleagues,² that reported on changes in cigarette smoking following an HIV diagnosis among a nationally-representative sample of people receiving HIV care, though the analysis did not examine potential associations with drug use or other correlates. Additional investigation among individuals drawn from a nationally representative sample would contribute to the literature by identifying additional information and quantification regarding characteristics of HIV-positive persons who smoke. Additionally, most investigations have focused on comparing current smokers versus non-smokers, without carving former smokers out from the non-smoker category.

In light of the aforementioned gaps in the literature, the aim of the present paper is to describe the cigarette smoking characteristics of HIV-positive individuals drawn from a nationally representative sample from the US, as well as to explore the associations of the aforementioned characteristics with current smoking status, differentiating between current, former, and never smokers. We hypothesize that a majority of persons with HIV in this sample will be current smokers and dependent on nicotine. Additionally, we hypothesize that

current smokers will report greater alcohol and illegal drug use, as well as prior alcohol and/or drug treatment than former and never smokers, respectively. These hypothesized associations are significant given the negative health and treatment outcomes that may result: smoking^{11,12} and substance use¹⁷ are associated with poor medication adherence and HIV treatment outcomes. Combination treatment of smoking and substance use has the potential to improve the health and quality of life of persons living with HIV/AIDS.

Methods

Data source

Data came from the 2005 ($n=55,905$), 2006 ($n=55,279$), 2007 ($n=55,435$), 2008 ($n=55,739$), 2009 ($n=55,772$), 2010 ($n=57,873$), and 2011 ($n=58,397$) National Survey on Drug Use and Health (NSDUH) public use data files. Consecutive years were combined to increase sample size of HIV-positive persons. Of the 394,400 participants surveyed, 128,144 were excluded because they were under the age of 18. An additional 265,900 were excluded because they did not self-report receiving a lifetime diagnosis of HIV. Furthermore, we excluded 7 individuals with a lifetime HIV diagnosis who reported an “other” race/ethnicity (i.e., non-Hispanic Native American/Alaska Native, non-Hispanic Asian, or non-Hispanic multiple races), due to small cell sizes and decreased power for analyses concerning these individuals. The remaining 349 HIV-positive individuals comprised the present analysis.

The NSDUH is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA) and is designed to provide estimates of the prevalence of extra-medical use of legal and illegal drugs in the household population of the US, age 12 and older.^{18–24} The survey employs a 50-state design with an independent multistage area probability sample for each of the 50 states and the District of Columbia. To increase the precision of estimates, African-Americans, Hispanics, and young people were oversampled. Response rates for completed surveys varied between 74–76% in 2005–2011.

Informed consent was obtained before the start of every interview. Participants were given a description of the study, read a statement describing the legislation that assures the confidentiality of any information provided by participants, and assured that participation in the study was voluntary. Additional information on maintenance of data confidentiality is available elsewhere.^{18–24} Surveys were administered by computer-assisted personal interviewing (CAPI) conducted by an interviewer and audio computer-assisted self-interviewing (ACASI). Use of ACASI was designed to provide respondents with a private and confidential means of responding to questions and to increase honest reporting of illegal drug use and other sensitive behaviors.^{18–25} Respondents were offered a US \$30 incentive payment for participation. The Johns Hopkins University Institutional Review Board approved this secondary data analysis.

Sampling weights for the NSDUH were computed to control for unit-level and individual-level non-response and were adjusted to ensure consistency with population estimates obtained from the US Census Bureau. In order to use data from the seven years of combined data, a new weight was created upon aggregating the seven datasets by dividing the original

weight by the number of data sets combined. Further descriptions of the sampling methods and survey techniques for the 2005–2011 NSDUH are found elsewhere.^{18–24}

Variables of interest

Socio-demographic Variables—Socio-demographic variables for this analysis included age, sex, race/ethnicity, education, total family income, and marital status. Age was dichotomized (18–34, 35+) and race/ethnicity was coded as a categorical variable with three levels: non-Hispanic White, non-Hispanic Black, and Hispanic. Educational attainment was dichotomized as "Less than high school" and "High school graduate or more. Total annual family income was categorized as follows: "<\$19,000", "\$20,000–\$39,000", "\$40,000–\$74,000" and "\$75,000+", and marital status was a categorical variable with three levels: currently married, previously married (including separated/divorced and widowed), and never married.

Drug and alcohol use, abuse/dependence, and treatment characteristics—Participants were asked "How long has it been since you last [used drug/drank an alcoholic beverage]?" for a variety of substances, including: alcohol, painkillers, cocaine, hallucinogens, heroin, inhalants, marijuana, sedatives, other stimulants, and tranquilizers. Individuals who responded "Within the past 30 days" were labeled as past month users of that substance. A dichotomous (yes/no) composite variable was created that described "any past month drug use" that summed across each of the individual past month drug use variables. A dichotomous (yes/no) variable for past month alcohol use was also created in the same fashion as the past month drug use variables, and a dichotomous variable for "binge drinking", defined as drinking at least 5 drinks on the same occasion on at least 1 day in the past 30 days, was created as well. Lifetime drug and/or alcohol treatment was measured with a dichotomous (yes/no) variable. Past year abuse or dependence was described using dichotomous variables (yes/no) for a variety of substances (analgesics, cocaine, hallucinogens, heroin, inhalants, marijuana, sedatives, stimulants, tranquilizers, and alcohol). A composite variable was also created to describe any past year substance abuse/dependence (not including alcohol).

Cigarette smoking characteristics—Participants were categorized as "never smokers", "former smokers", or "current smokers". Never smokers reported smoking less than 100 cigarettes in their lifetime. Former smokers reported smoking at least 100 cigarettes in their lifetime, but no cigarettes within the past 30 days. This classification scheme has been employed in prior research.²⁶ Current smokers were asked a variety of additional questions regarding their smoking such as: the number of cigarettes smoked per day (CPD; <1, 1–5, 6–15, 16–25, 26+), number of days smoked in the past month (1–10, 11–20, 21–30), daily smoking in the past month (yes/no), age at which they first tried smoking a cigarette (<10, 11–20, 21–30, 31+), type of cigarettes smoked most often in the past 30 days (Light, Ultra light, Mediums, Full flavor), and whether they smoked menthol or non-menthol cigarettes. Current smokers also completed the Fagerström Test for Nicotine Dependence (FTND).²⁷ The FTND measure is defined by assessing how soon after waking a respondent had their first cigarette. Based on the FTND scale, a respondent was defined as having nicotine dependence if the first cigarette was smoked within 30 minutes of waking on the days they

smoked, and the respondent reported smoking cigarettes in the past month.^{18–24} For the purpose of this analysis, individuals' nicotine dependence was dichotomized (yes/no).

Statistical Analyses

Data were weighted to reflect the complex design of the NSDUH sample and were analyzed with STATA SE version 12.0 software.²⁸ We used Taylor series estimation methods (STATA “svy” commands) to obtain proper standard error estimates for the cross-tabulations. Participants were stratified on the basis of smoking status (never, former, and current smokers), and chi-square (χ^2) tests were used to determine differences in socio-demographic, alcohol and illegal drug use, abuse/dependence, and treatment characteristics by smoking status. Descriptive statistics were reported to describe the cigarette smoking characteristics of current smokers. Unadjusted and adjusted multinomial logistic regression analyses were used to determine which socio-demographic, drug and alcohol use, abuse/dependence, and treatment characteristics were associated with current cigarette smoking. Variables in the adjusted model included sex, age, race/ethnicity, education, income, marital status, past month drug use, past month alcohol use, past month binge drinking, lifetime drug and/or alcohol treatment, and survey year. Variables were selected based on a combination of statistical significance ($p < 0.05$) in χ^2 analyses, as well as based on the literature.

Results

Sample characteristics

Table 1 depicts sociodemographic characteristics of the sample. The sample was predominantly male (82.2%), age 35+ (78.5%), and White (55.6%). Eighty percent of the sample reported receiving at least a high school degree, 38.2% had an annual total family income of \$19,999 or less, and the majority (72.5%) was not married.

Significant differences between smoking statuses were found for several sociodemographic characteristics. In terms of sex, former smokers were least likely to report being female (9.0%), followed by current smokers (15.6%) and never smokers (26.7%) $\chi^2 (2, N = 346) = 10900, p = 0.025$. Additionally, differences were found on the basis of age $\chi^2 (6, N = 349) = 15200, p = 0.015$ and marital status $\chi^2 (4, N = 349) = 45800, p < 0.001$.

Drug and alcohol use, abuse/dependence and treatment characteristics

A summary of drug and alcohol use, abuse/dependence, as well as treatment characteristics, can be found in Table 2. Approximately one-third (33.1%) of the sample used any illegal drugs within the past 30 days; the most commonly used drugs were marijuana (21.1%) and cocaine (7.9%). The prevalence of past month use of other drugs was comparably low (<6%). Past month alcohol use was common (60.6%), and past month binge drinking was reported by 27.2% of the sample. Twenty-seven percent of the sample reported engaging in alcohol or drug treatment within their lifetime. Furthermore, 13.0% of the sample met criteria for any substance abuse/dependence, and 13.6% met criteria for alcohol abuse/dependence. Corresponding to measures of past month use, marijuana (5.4%) and cocaine (5.0%) abuse/dependence were most commonly reported.

In terms of differences in substance use, abuse/dependence, and treatment between individuals of different smoking statuses, current smokers were most likely to report past month marijuana χ^2 (2, $N = 349$) = 31600, $p = 0.018$; cocaine χ^2 (2, $N = 349$) = 20200, $p = 0.008$; or any past month substance use χ^2 (2, $N = 349$) = 24600, $p = 0.022$; binge drinking χ^2 (2, $N = 349$) = 55000, $p < 0.001$; or lifetime drug/alcohol treatment χ^2 (2, $N = 349$) = 22200, $p = 0.006$. Conversely, former cigarette smokers were most likely to report past month use of tranquilizers χ^2 (2, $N = 349$) = 19400, $p < 0.001$. When examining substance abuse/dependence, current cigarette smokers were most likely to meet criteria for past year cocaine abuse/dependence χ^2 (2, $N = 349$) = 10800, $p = 0.030$; or any substance abuse/dependence χ^2 (2, $N = 349$) = 15100, $p = 0.037$. Additionally, former smokers were most likely to report past year inhalant abuse/dependence χ^2 (2, $N = 349$) = 10700, $p = 0.026$.

Cigarette smoking characteristics of current smokers

A summary of the smoking characteristics of current cigarette smokers with HIV/AIDS can be found in Table 3. Approximately 43% of the sample reported being current smokers. Smokers most commonly reported smoking between 16–25 cigarettes per day (CPD; 32.1%), and reported smoking on 21–30 days in the past month (77.9%). More than half (64.5%) reported daily smoking in the past month. Eighty-three percent began smoking between the ages of 11–20. The most common type of cigarette smoked was Full Flavor (53.0%), and approximately half of the smokers (55.2%) reported smoking menthol cigarettes most often in the past month. According to the FTND, 63.5% of smokers met criteria for nicotine dependence.

Multinomial logistic regression analyses

Unadjusted and adjusted multinomial logistic regression analyses can be found in Table 4. In adjusted analyses, females were less likely than males (aRRR=0.11, 95% CI=0.03–0.41) and persons who had never been married were less likely than married persons (aRRR=0.15, 95% CI=0.05–0.46) to be former smokers. Additionally, females (aRRR=0.37, 95% CI=0.14–0.96) and persons over the age of 35 (aRRR=0.37, 95% CI=0.16–0.89) were significantly less likely to be current smokers. Conversely, persons who reported being previously married (aRRR=5.72, 95% CI=1.40–23.31) were significantly more likely than currently married persons to be current cigarette smokers. Participants reporting binge drinking (aRRR=5.96, 95% CI=2.27–15.64) or lifetime drug or alcohol treatment (aRRR=5.12, 95% CI=2.09–12.55) were significantly more likely to be current smokers. Additionally, participants from survey years 2009 (aRRR=0.15, 95% CI=0.03–0.72) and 2011 (aRRR=0.09, 95% CI=0.02–0.44) were significantly less likely than participants from survey year 2005 to be current smokers.

Discussion

Slightly more than 40% the sample reported current cigarette smoking; this statistic is roughly consistent with, though slightly lower than, the prevalence of smoking among HIV-positive persons in prior reports (50–70%).^{2–4,6,7} Given that cigarette smoking among HIV-positive persons is associated with substantial health problems, this finding is of serious concern.^{8–10} To our knowledge, this is the first study that has examined cigarette smoking

and drug use characteristics among HIV-positive persons, comparing never, former, and current smokers, drawn from a nationally representative sample.

Current, former, and never smokers in this sample of individuals with HIV were significantly different in terms of a number of socio-demographic characteristics. For instance, while less than 20% of the total sample was female, never smokers were more likely to report female sex than either current or former smokers. Additionally, current cigarette smokers were more likely to be younger than either never or former smokers. In a report issued by the Centers for Disease Control and Prevention, current cigarette smoking was more prevalent among males than females (21.6% versus 16.5%) and among younger individuals (25–44 years (22.1%) versus 65+ (7.9%)).²⁹ Prior research has consistently shown that females utilize healthcare services more frequently than males.^{30,31} This observation may help to account, at least partially, for the sex findings in this sample. It is possible that the elevated number of female former smokers may be a result of increased contact with healthcare providers and subsequent promotion of smoking cessation during these visits: one study found that 81% of smokers living with HIV surveyed had received medical advice to quit smoking within the past year.³²

Individuals living with HIV under the age of 35 were significantly more likely than older persons to be current smokers. Focus on smoking cessation among younger smokers is important. Quitting smoking prior to the age of 35 has been shown to result in life expectancies comparable to that of never smokers.³³ Corresponding research concerning life expectancies following cessation has yet to be conducted among HIV-positive populations. However, findings from the present study, indicating that current smokers are more likely to be younger, have implications for continued efforts to promote smoking cessation among this group in an effort to maximize quality of life and life expectancies. Former smokers were more likely to report being married than were current or never smokers. Prior research has shown that entry into marriage is associated with reductions in substance use.³⁴ Thus, it is possible that spouses exert a form of social control regarding health behavior.³⁵ Interestingly, in contrast to previous research among HIV-positive persons¹¹ and the general population,³⁶ neither education nor income was found to be associated with current smoking in this sample.

Numerous differences between current smokers and non-smokers were observed on the basis of drug and alcohol use and treatment characteristics. Consistent with prior research,³⁷ current smokers were more likely than former or never smokers to report any past month drug use. Similar patterns were observed for various individual illegal substances (e.g., marijuana and cocaine) in unadjusted analyses. In instances where statistical differences were not observed between smoking statuses on the basis of substance use or abuse/dependence, low endorsement of use or abuse/dependence (e.g., only 4 participants reported past month heroin use) might be the cause, leaving analyses under-powered. Similarly, consistent with prior research,³ binge drinking was more likely among current smokers as compared to never smokers. However, differences were not observed based on past year alcohol use. This observation is inconsistent with prior research; as described previously, there is a particularly strong correlation between cigarette smoking and alcohol use.³⁸ Additionally, reports of engaging in some form of alcohol and/or drug treatment was most

prevalent among current smokers, followed by former and never smokers, respectively. In adjusted analyses, current smokers were significantly more likely than never smokers to have utilized such treatments. Within some treatment communities, major life changes during the early portions of the recovery process are discouraged for fear of triggering relapse, and the treatment culture has accepted that quitting tobacco use would constitute a major life change.^{39,40} Additionally, in some treatment organizations, smoking is a part of the staff culture, where staff members take smoking breaks with one another, and sometimes even with their clients.⁴¹ It should be noted that observed associations between smoking status and substance/alcohol use could be at least partially a result of residual confounding. A variety of characteristics, such as general health awareness or concern about one's health, may help to explain these associations.

In terms of smoking characteristics, our findings are largely consistent with findings from previous research. A sizable portion of HIV-positive individuals in this sample reported current smoking, with a prevalence that is slightly lower than, but roughly consistent with other estimates reported.²⁻⁴ Smokers in this sample smoked approximately a pack of CPD, slightly more CPD than reported in other samples of HIV-positive smokers.³ The estimated prevalence of nicotine dependence, as judged by the FTND, in this sample is also roughly consistent with findings from prior studies.^{3,13}

Findings from the present suggest a need for integrated substance abuse and cigarette smoking cessation treatment for HIV-positive persons, possibly linked to HIV treatment itself. Baca and Yahne⁴² have offered several suggestions for integrating smoking cessation therapies into substance abuse treatment, which are likely also applicable to efforts to integrate cessation therapy into the treatment of HIV. To begin, staff and practitioners should be provided with training to help patients with smoking cessation. This step is particularly important, since in a survey of providers listed in the HIV medicine Association, only 22.9% reported that they had ever received formal training or clinical education on this topic⁴³. Additionally, all patients and staff who currently smoke should be provided with multiple opportunities for cessation and given a variety of options in terms of smoking cessation methodologies. Niaura and colleagues⁴⁴ have summarized findings from a variety of existing cessation interventions among HIV-positive smokers and found some evidence for their effectiveness.

Findings from this study should be interpreted in the context of several limitations. For instance, the cross-sectional nature of the NSDUH renders us unable to make statements regarding the causal nature of observed associations. Additionally, the NSDUH does not contain questions pertaining to treatment for nicotine dependence, or other smoking cessation-related information such as use of nicotine replacement therapy, which would aid in further characterizing this sample, as well as further our knowledge of smoking cessation behaviors among HIV-positive smokers. Furthermore, given that all information was collected via self-report, social desirability bias is a potential concern. For instance, the lack of biochemical validation of smoking status and substance use may result in under-reporting of smoking and other substance use. Additionally, it is possible that there is some amount of under-reporting of HIV status in this sample. As a result, this sample of HIV-positive smokers may be unique, and may be limited in generalizability to the US general population.

We are unable to determine whether this under-reporting is due to social desirability bias or to a lack of awareness of HIV status on the part of participants'. Additionally, some individuals may under-report cigarette smoking, resulting in their classification as "non-smokers", and also under-report other substance use. Consequently, this can result in inflated statistical significance of drug use among current smokers as compared to non-smokers. Also, because we excluded individuals of "other" race/ethnicity from these analyses due to a small sample size, we are limited in our abilities to examine some racial/ethnic differences.

In spite of the aforementioned limitations, the present study has several strengths as well. Findings from this study are in line with previous research and help to confirm that cigarette smoking is a significant public health issue among HIV-positive persons, both in terms of overall smoking prevalence, as well as the proportion of HIV-positives who smoke daily and are nicotine dependent. Additionally, findings from the present study enhance our understanding of the highly comorbid nature of cigarette smoking and drug and alcohol use among persons with HIV. Future research should include further examination of the nature of cigarette smoking among HIV-positive persons, for instance the role that HIV symptoms may play in cognitive smoking processes.⁴⁵ Findings from such studies may help to improve smoking cessation treatments among HIV-positive individuals.

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Table 1
Selected characteristics of never smokers, former smokers, and current smokers living with HIV/AIDS age 18 and older (n=349). Data from the 2005–2011 National Survey on Drug Use and Health, United States.

Characteristic	Total sample		Never smokers		Former smokers		Current smokers		p-value
	n	Wt% ^a (SE) ^b	n	Wt% ^a (SE) ^b	n	Wt% ^a (SE) ^b	n	Wt% ^a (SE) ^b	
Sex									
Male	261	82.2 (2.78)	91	74.3 (5.27)	44	91.0 (3.47)	126	84.4 (3.43)	0.025
Female	88	17.8 (2.78)	3836	26.7 (5.27)	9	9.0 (3.47)	43	15.6 (3.43)	
Age									
18–34	135	21.5 (2.69)	54	18.3 (4.57)	6	9.4 (2.64)	75	29.9 (5.18)	0.013
35+	214	78.5 (2.69)	73	81.7 (4.57)	47	90.6 (2.64)	94	70.1 (5.18)	
Race/ethnicity									
White	180	55.6 (4.19)	59	53.7 (6.31)	27	57.8 (9.17)	94	56.0 (6.73)	0.652
Black	111	26.4 (3.74)	48	29.1 (6.32)	17	28.1 (8.04)	46	23.5 (4.76)	
Hispanic	58	18.0 (3.09)	20	17.2 (5.97)	9	14.1 (5.1)	29	20.4 (5.84)	
Education									
< High school	90	19.4 (2.88)	28	17.4 (4.83)	9	15.0 (5.46)	53	23.2 (4.16)	0.457
High school+	259	80.6 (2.88)	99	82.6 (4.83)	44	85.0 (5.46)	116	76.8 (4.16)	
Total family income									
<\$19,999	140	38.2 (4.48)	47	40.7 (7.06)	17	27.6 (8.44)	76	41.3 (7.26)	0.343
\$20,000–\$39,999	117	31.5 (3.56)	39	27.8 (5.83)	18	27.9 (7.25)	60	36.3 (5.16)	
\$40,000–\$74,999	37	11.6 (2.61)	16	12.0 (5.07)	8	22.0 (7.56)	13	6.3 (2.23)	
\$75,000+	55	18.7 (4.17)	25	19.5 (5.78)	10	22.5 (8.34)	20	16.1 (5.86)	
Marital status									
Married	32	12.8 (3.10)	14	10.1 (3.25)	8	32.1 (9.32)	10	5.7 (2.25)	0.001
Previously married	60	14.7 (2.20)	14	8.0 (2.99)	10	17.1 (5.70)	36	19.1 (3.82)	
Never married	257	72.5 (3.55)	99	81.9 (5.00)	35	50.8 (9.54)	123	75.2 (4.17)	

^aWeighted percentage

^bSE = standard error

Table 2

Alcohol and substance use characteristics of never smokers, former smokers, and current smokers living with HIV/AIDS age 18 and older (n=349). Data from the 2005–2011 National Survey on Drug Use and Health, United States.

Characteristic	Total sample			Never smokers			Former smokers			Current smokers			p-value
	n	Wt% ^a (SE) ^b	n	Wt% ^a (SE) ^b	n	Wt% ^a (SE) ^b	n	Wt% ^a (SE) ^b	n	Wt% ^a (SE) ^b	n	Wt% ^a (SE) ^b	
<i>Past 30 Day Illegal Drug Use</i>													
Marijuana	82	21.1 (2.89)	15	8.6 (3.32)	7	15.9 (8.31)	60	34.0 (5.04)	0.018				
Cocaine	27	7.9 (1.89)	5	2.3 (1.39)	1	3.2 (3.19)	21	15.0 (3.86)	0.008				
Crack cocaine	11	2.9 (1.23)	1	0.01 (0.01)	1	3.2 (3.19)	9	5.0 (2.27)	0.100				
Heroin	4	2.0 (1.43)	0	0	1	3.2 (3.19)	3	3.0 (2.90)	0.569				
Hallucinogens	10	1.4 (0.74)	2	0.8 (0.7)	0	0	8	2.6 (1.63)	0.301				
LSD	5	0.9 (0.68)	1	0.1 (0.1)	0	0	4	1.9 (1.57)	0.229				
PCP	1	0.01 (0.01)	0	0	0	0	1	0.2 (0.2)	0.788				
Ecstasy	7	1.3 (0.73)	1	0.7 (0.7)	0	0	6	2.3 (1.61)	0.370				
Inhalants	19	5.6 (1.68)	8	8.9 (3.45)	3	6.5 (4.14)	8	2.6 (1.62)	0.247				
Analgesics	18	3.9 (1.73)	5	1.2 (0.76)	1	3.2 (3.19)	12	6.4 (3.70)	0.227				
Tranquilizers	12	3.1 (1.35)	1	0.01 (0.01)	3	10.3 (5.75)	8	2.1 (1.02)	0.001				
Stimulants	13	3.1 (1.27)	5	4.4 (2.72)	0	0	8	3.7 (1.88)	0.415				
Methamphetamine	10	3.1 (1.26)	3	4.2 (2.72)	0	0	7	3.6 (1.88)	0.436				
Sedatives	3	1.2 (0.87)	0	0	1	3.7 (3.67)	2	1.0 (0.87)	0.252				
Any drug use	116	33.1 (3.25)	29	19.8 (5.12)	12	29.3 (9.13)	75	46.0 (5.94)	0.022				
<i>Past 30 Day Alcohol Use</i>													
Any alcohol use	219	60.9 (3.99)	71	53.5 (6.87)	31	55.3 (8.92)	119	69.7 (5.69)	0.145				
Binge drinking	126	27.2 (3.20)	33	12.5 (3.51)	10	13.0 (5.13)	83	46.3 (5.62)	<0.001				
<i>Treatment</i>													
Lifetime drug or alcohol treatment	104	27.0 (3.19)	20	14.8 (4.64)	12	24.2 (7.32)	72	38.4 (4.17)	0.007				
<i>Past Year Abuse/Dependence</i>													
Alcohol	69	13.6 (2.74)	20	8.2 (2.63)	5	14.6 (8.55)	44	17.5 (3.99)	0.343				
Analgesics	10	2.2 (0.53)	1	0.1 (0.1)	1	3.2 (3.19)	8	3.46 (1.71)	0.290				
Cocaine	22	5.0 (1.61)	3	0.8 (0.53)	2	4.2 (3.31)	17	8.9 (3.12)	0.030				
Hallucinogens	4	0.4 (0.21)	2	0.5 (0.39)	0	0	2	0.5 (0.37)	0.657				

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Characteristic	Total sample		Never smokers		Former smokers		Current smokers		p-value
	n	Wt% ^a (SE) ^b	n	Wt% ^a (SE) ^b	n	Wt% ^a (SE) ^b	n	Wt% ^a (SE) ^b	
Heroin	5	2.0 (1.49)	0	0	1	3.2 (3.19)	4	3.1 (3.12)	0.568
Inhalants	6	2.0 (0.99)	1	1.2 (1.240)	3	6.5 (4.14)	2	0.5 (0.42)	0.026
Marijuana	29	5.4 (1.43)	5	2.6 (1.41)	4	5.1 (3.49)	20	7.8 (2.62)	0.280
Sedatives	3	0.1 (0.1)	1	0.1 (0.1)	1	0.2 (0.17)	1	0.1 (0.14)	0.436
Stimulants	6	0.5 (0.27)	2	0.7 (0.70)	0	0	4	0.6 (0.31)	0.606
Tranquilizers	4	1.0 (0.73)	0	0	1	3.2 (3.19)	3	0.7 (0.55)	0.206
Any abuse/dependence	56	13.0 (2.55)	11	5.3 (2.17)	7	11.4 (5.39)	38	20.1 (5.37)	0.037

^aWeighted percentage

^bSE = standard error

Table 3

Cigarette smoking characteristics of current smokers living with HIV/AIDS age 18 and older (n=169). Data from the 2005–2011 National Survey on Drug Use and Health, United States.

Characteristic	N	Wt% ^a (SE) ^b
Cigarettes Per Day (CPD)		
<1	8	6.4 (2.93)
1–5	51	28.9 (6.82)
6–15	53	25.4 (4.21)
16–25	42	32.1 (7.75)
26+	15	7.2 (2.47)
Days smoked in past month		
1–10	22	8.7 (2.45)
11–20	18	13.4 (4.43)
21–30	129	77.9 (5.03)
Daily smoking in the past month		
No	55	35.5 (6.30)
Yes	114	64.5 (6.30)
Age first tried a cigarette		
<10	18	9.6 (3.88)
11–20	138	83.0 (4.97)
21–30	11	6.9 (3.28)
31+	1	0.5 (0.51)
Type of cigarette smoked most often in past 30 days		
Light	44	34.3 (6.02)
Ultra Light	9	8.7 (3.46)
Mediums	12	4.0 (1.62)
Full Flavor	104	53.0 (7.15)
Smoke menthol cigarettes most often in past 30 days		
Non-menthol	82	55.2 (7.12)
Menthol	87	44.8 (7.12)
Fagerström Test of Nicotine Dependence (FTND)		
No	63	36.5 (5.74)
Yes	106	63.5 (5.74)

^aWeighted percentage

^bSE = standard error

Unadjusted and adjusted multinomial logistic regression models for the association between current cigarette smoking and characteristics of HIV-positive persons (n=356), data from the 2005–2011 National Survey on Drug Use and Health, United States.

Table 4

Characteristic	Former smokers vs. never smokers		Current smokers vs. never smokers	
	RRR ^a (95% CI) ^b	aRRR ^{c,d} (95% CI) ^b	RRR ^a (95% CI) ^b	aRRR ^{c,d} (95% CI) ^b
Sex				
Male	1.0	1.0	1.0	1.0
Female	0.28 (0.11–0.74)	0.11 (0.03–0.41)	0.53 (0.26–1.09)	0.37 (0.14–0.96)
Age				
18–34	1.0	1.0	1.0	1.0
35+	2.16 (0.87–5.35)	1.49 (0.51–4.36)	0.52 (0.23–1.18)	0.37 (0.16–0.89)
Race				
White	1.0	1.0	1.0	1.0
Black	0.90 (0.35–2.27)	1.48 (0.47–4.58)	0.77 (0.33–1.83)	0.54 (0.19–1.54)
Hispanic	0.76 (0.22–2.61)	0.95 (0.28–3.26)	1.13 (0.34–3.76)	0.43 (0.12–1.60)
Education				
<High school	1.0	1.0	1.0	1.0
High school+	1.20 (0.41–3.47)	0.77 (0.26–2.24)	0.70 (0.32–1.53)	0.79 (0.31–2.01)
Income				
<\$19,999	1.0	1.0	1.0	1.0
\$20,000–\$39,999	1.48 (0.42–5.19)	1.30 (0.34–4.94)	1.29 (0.52–3.17)	1.10 (0.36–3.36)
\$40,000–\$74,999	2.70 (0.59–12.34)	2.00 (0.51–7.82)	0.51 (0.15–1.70)	0.41 (0.10–1.73)
\$75,000+	1.70 (0.49–5.88)	0.83 (0.21–3.20)	0.81 (0.23–2.83)	0.50 (0.14–1.75)
Marital status				
Married	1.0	1.0	1.0	1.0
Previously married	0.67 (0.18–2.53)	0.86 (0.26–2.91)	4.23 (1.27–14.06)	5.72 (1.40–23.31)
Never married	0.19 (0.06–0.58)	0.15 (0.05–0.46)	1.64 (0.54–4.95)	1.08 (0.26–4.39)
Past month drug use	1.68 (0.49–5.73)	1.45 (0.42–4.92)	3.45 (1.46–8.14)	2.47 (0.94–6.49)
Past month alcohol use	1.07 (0.43–2.67)	1.36 (0.53–3.43)	1.99 (1.01–3.94)	1.01 (0.39–2.58)
Binge drinking	1.03 (0.33–3.20)	0.90 (0.29–2.83)	6.04 (2.74–13.29)	5.96 (2.27–15.64)
Treatment	1.83 (0.60–5.59)	1.96 (0.60–6.34)	3.58 (1.61–7.95)	5.12 (2.09–12.55)

Characteristic	Former smokers vs. never smokers		Current smokers vs. never smokers	
	RRR ^a (95% CI) ^b	aRRR ^{c,d} (95% CI) ^b	RRR ^a (95% CI) ^b	aRRR ^{c,d} (95% CI) ^b
Survey year				
2005	1.0	1.0	1.0	1.0
2006	0.18 (0.03–1.19)	0.32 (0.04–2.55)	0.28 (0.06–1.23)	0.25 (0.05–1.14)
2007	0.50 (0.08–3.21)	0.83 (0.18–3.89)	0.49 (0.14–1.71)	0.43 (0.11–1.69)
2008	0.76 (0.13–4.42)	2.31 (0.38–14.08)	0.43 (0.09–2.03)	0.55 (0.09–3.22)
2009	0.40 (0.07–2.27)	0.74 (0.18–3.02)	0.12 (0.03–0.56)	0.15 (0.03–0.72)
2010	0.69 (0.12–3.96)	1.04 (0.21–5.21)	0.29 (0.06–1.44)	0.20 (0.04–1.15)
2011	0.20 (0.04–1.07)	0.24 (0.05–1.18)	0.15 (0.03–0.63)	0.09 (0.02–0.49)

^aRRR = relative risk ratio

^bCI = confidence interval

^caRRR = adjusted relative risk ratio

^dAnalysis adjusted for sex, age, race/ethnicity, education, income, marital status, past month alcohol use, past month drug use, past month binge drinking, lifetime drug and/or alcohol treatment, and survey year