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The Impact of the AIDS Drug Assistance Program (ADAP) on Use of Highly Active Antiretroviral and Antihypertensive Therapy among HIV-Infected Women

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Abstract

Objectives—To evaluate the association between enrollment into an AIDS Drug Assistance Program (ADAP) and use of highly active antiretroviral therapy (HAART) and antihypertensive therapy.

Methods—Cross-sectional analyses of data were performed on HAART-eligible women enrolled in the California (n=439), Illinois (n=168), and New York (n=487) Women's Interagency HIV Study (WIHS) sites. A subset of HIV-infected women with hypertension (n=395) was also analyzed. Unadjusted and adjusted backward stepwise elimination logistic regression measured the association between demographic, behavioral, and health service factors and non-use of HAART or antihypertensive medication.

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Contributors

Thomas Yi and Nancy Hessol conceptualized and designed the study, performed the data analysis, and prepared the draft manuscript. Jennifer Cocohoba contributed to the conceptualization and provided clinical guidance. All authors contributed to data collection and reviewing as well as editing of the manuscript.

Human Participant Protection

Study protocols and consent materials were reviewed and approved by the institutional review boards at each of the collaborating institutions and informed consent was obtained from the participants.

Results—In adjusted analysis of HAART non-use, women without ADAP were significantly more likely not to use HAART (odds ratio [OR] = 2.4, 95% confidence interval [CI] = 1.5–3.7) than women with ADAP. In adjusted analysis of antihypertensive medication non-use, women without ADAP had an increased but not significant odds of antihypertensive medication non-use (OR = 2.4, 95% CI = 0.93–6.0) than women with ADAP.

Conclusions—Government-funded programs for prescription drug coverage, such as ADAP, may play an important role in how HIV-positive women to access and use essential medications for chronic diseases.

Keywords

AIDS; antiretroviral therapy; hypertension; women; healthcare disparity; prescription insurance

INTRODUCTION

The United States AIDS Drug Assistance Program (ADAP) was established in 1987 to help HIV-infected patients pay for zidovudine, the first HIV drug treatment. Currently, ADAP is the nation's primary prescription assistance program to help low-income, under- and uninsured HIV-infected patients access life-sustaining medications.[1] At the end of 2007, 183,299 people, a third of the United States HIV-infected population, were enrolled in ADAP. Ethnic minorities, such as African-Americans and Hispanics, represented 60% of enrollees, 72% were uninsured, and 74% had an annual income at or below 200% of the Federal Poverty Level (FPL).1

All ADAP programs are federally funded but most states provide monetary support as well. With the current economic recession, many state ADAP budgets have been reduced. In March 2009, 21 programs experienced budget decreases including 8 states that stopped funding all together. Also, between 2007 and 2008, 40 states experienced an increased number of clients served. [1] With rising unemployment, treatment recommendations by the United States Department of Health and Human Services (DHHS) for earlier initiation of HAART,[2] and financial deficits for other health insurance programs for low-income populations, the demand for ADAP services are expected to rise.1

In addition to state variation in funding, each state has different ADAP patient eligibility criteria and drug formularies. Eligibility criteria likely reflect the demographic characteristics of each state's population of HIV-infected individuals and the state's budgetary restrictions. In 2008, the eligibility requirement for each state's ADAP ranged from 200% of the FPL in Idaho, Iowa, Louisiana, Nebraska, Oklahoma, Oregon and Texas to 500% in Arkansas, Delaware, District of Columbia, Maine, Maryland, New Jersey, and Ohio.[1] Since July 2007, each state has been required to include at least one medication from each antiretroviral class on its ADAP formulary. However, non-HIV medications covered by each state differed as ADAP formularies in 2008 ranged from 28 drugs in Idaho to 466 drugs in New York.[1] For example, medications to treat hypertension, shown to be prevalent among 29–34% of HIV-positive patients,[3,4] were covered by some states, such as New York, but not in others, such as California or Illinois. In 2008, non-HIV medication accounted for 31% of all prescriptions filled for ADAP nationally.[1]

Previous studies have identified African-American ethnicity,[5,6,7,8,9,10,11,12,13] female gender,[5,8,9] lower educational attainment,[5,10,13] injection drug use,[5,7,9,10,12,13] and being uninsured[11,13,14] as factors associated with decreased use of HAART. However, there are a limited number of studies that specifically review ADAP and its association with HAART use and few, if any, which explore state-by-state program variability. To our knowledge, no

studies have investigated the relationship between ADAP and use of non-antiretroviral medications.

The goal of this study was to investigate the impact of ADAP enrollment on the use of prescriptions for both HIV infection and hypertension. We choose to include hypertension because it is a common condition among people with HIV infection[2,3] and enrollment in ADAP may affect both access and use of antihypertensive medications. The aims of the study were to evaluate whether enrollment into ADAP, including state differences in ADAP eligibility criteria and drug formularies, was associated with HAART and antihypertensive medication use by comparing HAART-eligible women enrolled in ADAP to women who relied on other forms of health insurance for medication coverage.

METHODS

Study population

Data from the United States Women's Interagency HIV Study (WIHS) were used for this investigation. In brief, recruitment of HIV-infected and uninfected women into the WIHS occurred in 1994–1995 and again in 2001–2002, for a total of 2,791 HIV-infected and 975 HIV-uninfected women. Data for the WIHS were collected from the following six centers: Brooklyn, Bronx, Washington D.C., Chicago, the Los Angeles area, and the San Francisco Bay Area. Recruitment occurred at a variety of venues, including HIV care and testing sites, drug and TB treatment programs, community-based organizations, and sexually transmitted disease clinic programs. Women were seen for core study visits twice a year and data were collected with a standardized interview-based questionnaire. Detailed information about the WIHS study methodology, quality assurance, and baseline characteristics of enrollees can be found in previously published literature.[15,16] Study protocols were reviewed and approved by the institutional review boards, and written informed consent was obtained from the participants.

The inclusion criterion for both analyses was enrollment in five of the six WIHS sites (N=2393) from California, Illinois, and New York during visit 28 (April through September 2008). Participants from the Washington D.C. area were excluded (N=419), since this site has participants from more than one jurisdiction (the District, Maryland, and Virginia). For the use of HAART analyses, only women who were clinically eligible for HAART, based on the 2008 DHHS HIV treatment guidelines, were included (N=1139).[17] Using longitudinal WIHS data, we identified women who were HAART eligible based on a history of or current (a) CD4+ count of less than 350/mm^3, (b) AIDS-defining illness,[17] and/or (c) HAART use. Women who currently or have had a history of HAART use were included since HAART should not be discontinued once initiated to prevent resistance. Pregnant women at visit 28 (N=45) were excluded, since HIV and hypertensive management differ in pregnant and non-pregnant women.

For the use of antihypertensive medication analyses, we used a subset of women from the first study group. This subset only included women who were clinically defined as hypertensive based on the latest guidelines by the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC VII) (N=395).Using longitudinal WIHS data, we identified women with hypertension based on having: (a) a history of diastolic blood pressure 90mmHg or greater over two subsequent visits (approximately a six month interval), (b) a history of systolic blood pressure 140mmHg or greater over two subsequent visits, and/or (c) report of current usage of one or more antihypertensive medications.[19] Women with a history of antihypertensive use was not included since lifelong use of hypertensive medications is not indicated for all patients with hypertension.

For both analyses, we included women who currently reported taking the medications of interest, HAART or antihypertensives. This was done because women may have had clinical indications for use of these medications that were diagnosed outside of the WIHS and therefore their disease was controlled during the time of data collection.

Dependant and Independent Variables

The primary dependent variables for this analysis were self-reported current use of HAART (yes or no) and self-reported use of antihypertensive medication (yes or no). We categorized reported HIV medications as HAART using guidelines published by the DHHS at the time of the study visit.[17] Combination antiretroviral therapy that was not defined as HAART by the DHHS, monotherapy, or no therapy were all categorized as non-HAART use. Indications for antihypertensive therapy, described previously, were based on guidelines by the JNC VII.19

Our primary independent variables were self-reported enrollment into ADAP (yes or no) and state of residence (California, Illinois, or New York). Type of health insurance was categorized in four mutually exclusive groups: private, Medicare, Medicaid (Medi-Cal in California), and uninsured. Those with private or student-health insurance, as well as those who reported insurance that could not be classified, were categorized in the private category. Because ADAP enrollment may or may not be related to type of health insurance, ADAP was maintained as a separate variable from health insurance.

Socio-demographic factors included in the analysis were race/ethnicity (white non-Hispanics, white Hispanics, Hispanic and non-Hispanic blacks, and other), age (per decade), educational attainment (categorized as completion of some high school, a high school diploma, and some college or more), employment, living situation, and household income (categorized as a yearly income of ≤$12,000, $12,000–$36,000, or >$36,000).

Health factors that were assessed include depressive symptoms (a binary indicator of a score of 16 or higher on the Center for Epidemiological Studies Depression (CES-D) Scale)[20], indicators of alcohol use (non-use, light drinker (<3 drinks per week), moderate (3–13 drinks per week), or heavy (>13 drinks per week) in the past 6 months), individual indicators of crack, cocaine, methadone, or heroin use (yes or no within the past 6 months), and concurrent CD4+ cell count and HIV RNA viral load.

Statistical Analysis

Contingency table analyses were performed to compare the distribution of participant characteristics by state and *P* values were based on chi-square or Fisher exact tests. Unadjusted logistic regression models assessed the association between the independent variables and the two dependent variables, HAART non-use and antihypertensive non-use. We then performed adjusted backward stepwise elimination logistic regression models to eliminate non-significant ($P>0.05$) independent variables. Our primary independent variables, ADAP enrollment and state of residence, were retained in the stepwise models, regardless of their level of significance. Statistical analyses were performed using SASR software version 9.2.[21]

RESULTS

The total number of HAART eligible women who met our inclusion criteria was 1094 (Table 1). Since two WIHS centers are located in California and two in New York, 40% of our population came from California study sites, 45% from New York, and only 15% from Illinois. Across all states, the majority of women were over 40 years old and categorized themselves as African-American. Approximately two-thirds of the women had less than a

college education, were not married and/or living alone, and reported being unemployed. Half earned less than $12,000 per year and Medicaid was the dominant form of health insurance (50%) in our population. About 24% of the women were enrolled in ADAP. For health-associated factors, 37% reported depressive symptoms, 9% used illicit drugs, 36% reported moderate to high alcohol use, 39% smoked, and 13% used marijuana. Furthermore, 46% had CD4+ cell counts above 500/mm^3 and 62% had HIV viral loads that were undetectable (<80 copies). Overall 74% of the women who were clinically eligible for HAART reported using HAART regimens, 2% were on non-HAART antiretroviral therapy, and 24% were not on any form of antiretroviral therapy. Between states, there were statistically significant differences in the following: race/ethnicity, living situation, yearly household income, health insurance type, ADAP enrollment, depressive symptoms, illicit drug and alcohol use, cigarette smoking, and marijuana use.

The total number of HAART and antihypertensive eligible women who met our inclusion criteria was 395 (Table 2). Overall, baseline population characteristics were similar to the initial HAART analysis population. Among this population, 77% of those who had indications for antihypertensive therapy were on at least one medication for hypertension while 23% were not. Between states, distributions of race/ethnicity, annual household income, type of health insurance, ADAP enrollment, depressive symptoms and marijuana use were significantly varied.

Relationship of ADAP Enrollment, Study Site, Age, Race/Ethnicity, Income, and Alcohol Abuse on HAART Use

The unadjusted and adjusted odds ratios for non-use of HAART are shown in Table 3. After adjustment, ADAP enrollment, age, race/ethnicity, income, and alcohol use were found to be statistically significant ($p \leq 0.05$) with HAART non-use. Women without ADAP were more than two-times more likely not to be on a HAART regimen (OR=2.35, CI=1.49–3.71), while the state of study site showed no association.

Older women were less likely not to use HAART than younger women per decade of age (OR=0.74, CI=0.61–0.89). Compared to African-Americans, Hispanic whites (OR=0.51, CI=0.29–0.92) and non-Hispanic whites (OR=0.21, CI=0.10–0.44) were less likely not to report taking HAART. Compared with those with an annual income less than $12,000, women with annual incomes from $12,000–$36,000 were 30% less likely not to be HAART users (OR=0.70, CI=0.50–0.99). Women who reported moderate alcohol use were two times more likely not to use HAART (OR=2.08, CI=1.19–3.65) and those who reported heavy use were almost four times more likely not to be on HAART (OR=3.75, CI=1.59–8.84) compared to alcohol abstainers.

Relationship of ADAP, Study Site, Race/Ethnicity, Income, Smoking, and Health Insurance on Antihypertensive Use

The unadjusted and adjusted regression results for non-use of antihypertensive medication are shown in Table 4. After adjustment, race/ethnicity, income, smoking, and type of health insurance were shown to have a statistically significant association (p 0.05) with antihypertensive non-use. While ADAP coverage and study site state did not show statistically significant relationships with antihypertensive utilization, ADAP non-enrollment approached significance (p=0.07) with a trend towards a greater likelihood of non-use (OR=2.37, CI=0.93–6.03).

Compared to African-Americans, women categorized as other ethnicities were nearly five times more likely not to use antihypertensive medication (OR=4.76, CI=2.48–9.14). Women with an annual income >$36,000 were 80% less likely not to use antihypertensive drugs in

relation to those who made less than $12,000 per year (OR=0.20, CI=0.06–0.71). Smokers were 80% more likely not to report taking antihypertensive therapy (OR=1.80, CI=1.03–3.16) than non-smokers. In comparison to those with private insurance, women on Medicare (OR=0.22, CI=0.08–0.62) or Medicaid (OR=0.23, CI=0.09–0.60) were less likely not to use antihypertensive medications.

DISCUSSION

The results of our study show that ADAP enrollment, regardless of state of residence, was associated with increased HAART utilization among clinically eligible HIV-infected women. Also, we found that HAART- and antihypertensive-indicated women enrolled in ADAP had increased, but non-significant, odds of antihypertensive medication use compared to women not enrolled in ADAP. To our knowledge, this is the first study to suggest that ADAP enrollment may increase the use of non-antiretroviral prescription drugs. Additionally, the breadth of data in this study presents a unique opportunity to assess state differences in ADAP enrollment criteria and formularies and we found that state of residence may have a lesser role in use and non-use of HAART than other factors.

Although New York had the most lenient income eligibility criteria for ADAP (below 423% FPL) compared to California and Illinois (below 400% FPL),[1] women in New York did not have significantly different HAART utilization rates compared to the other states. California had the largest percentage of women enrolled (42.8%) while Illinois and New York had much lower rates at 13.7% and 10.9% respectively. This likely reflects each state's policy towards Medicaid and ADAP co-enrollment. California allows Medi-Cal (the state's form of Medicaid) and ADAP co-insurance while New York and Illinois mostly allow only patients without health insurance to enroll into ADAP. Therefore, while New York had the broadest financial eligibility for ADAP enrollment, differences in co-insurance criteria complicated our analysis.

Other factors including age, ethnicity, income, and alcohol use were found to be associated with HAART utilization. Non-Hispanic and Hispanic white women had higher likelihood of HAART use when compared to African-Americans. These findings are similar to many studies,[5,6,7,8,9] including those done on the WIHS population,[10,11,12,13] which consistently have shown that health disparities by ethnicity still exist. Other studies support our finding that increased alcohol consumption is associated with decreased likelihood of antiretroviral utilization,[11] however it is unclear whether alcohol use is related to patient factors, such as non-compliance, or providers' unwillingness to prescribe therapy. In our study there was a dose-response relationship – higher consumption was more strongly associated with non-use of HAART utilization – which leads us to believe that this is a strong predictor. Women with higher income were more likely to report HAART use. This may reflect increased access to care and ability to pay for medication.

While ADAP enrollment increased the likelihood of using HAART, its relationship with antihypertensive medication use was of borderline statistical significance (p= 0.07), due in part to the smaller sample size for this subgroup analyses. State variability was not associated with antihypertensive drug utilization even though New York's ADAP included hypertension medications on its formulary.[1] California's ADAP does not cover hypertension medication and as a result enrollees may access these drugs using Medi-Cal. However, New York enrollees cannot have any other forms of insurance and as a result may utilize ADAP to access antihypertensive medication when they otherwise could not. Like the HAART analysis, ADAP eligibility policies regarding co-insurance complicated our study.

Although the association between ADAP enrollment and antihypertensive utilization was of borderline significance, women with Medicaid and Medicare insurance were more likely to use hypertension medication than those with private insurance. A review of data within the Women's Health Initiative found that women insured by Medicaid had higher treatment rates and better outcomes compared to those with private insurance and only Medicare.[22] The author hypothesized that differences in medication coverage and/or age distributions could explain this disparity. Therefore, other government-sponsored health and prescription insurance programs may play a larger role than ADAP in terms of antihypertensive use, even in HIV-infected women.

Similar to HAART use, women with higher incomes were more likely to use antihypertensive medication. In addition, cigarette smokers were less likely to use hypertension medications. This finding is particularly troublesome as smokers who are hypertensive are at significantly higher risk of developing cardiovascular complications.[23] Studies have shown that smokers may have decreased adherence to medications[24] which may explain this population's decreased use of antihypertensive medication.

In contrast to HAART use, African-Americans were more likely to use antihypertensive medication compared to non-Hispanic whites and other ethnicities. Prior studies have reinforced our finding but also report that while African-Americans are more likely to use antihypertensive medication than non-Hispanic whites, rates of controlled hypertension are lower.[25,26,27]

The juxtaposition between ethnicity and HAART and antihypertensive drug use warrants further investigation into the reasons why these disparities exist. A review of HIV care in minority populations by Cargill and Stone theorized that patient satisfaction with their care, prescriber bias, and patient-physician racial discordance could be possible provider-related reasons for HIV treatment disparities.[28] They also found that minorities needed more information and time to make HIV-related treatment decisions. Stigma related to HIV, which can lead to delayed seeking of treatment and even denial of infection, has also been thought to influence antiretroviral treatment use and adherence.[28] These reasons highlight the need for better outreach and education to minority populations about the benefits of HAART and to destigmatize HIV as a disease.

One limitation of this study is the cross-sectional design. Thus the results represent only one point in time and we are unable to determine a temporal relationship between enrollment into ADAP and use of HAART or antihypertensive medication. However, longitudinal data exists and could be the subject of a future investigation. While longitudinal data was used to determine our study population and eligibility criteria, health outcomes, though collected by WIHS, were not included within this analysis. Therefore, we did not determine whether ADAP's influence on HAART and antihypertensive medication use are also predictive of improved health results, such as elevated CD4+ cell counts and blood pressure control. Another limitation is that other unmeasured factors that may influence medication use, such as prescriber patterns and frequency of clinic visits, were not assessed. In addition, these results are based on HIV-infected women who were recruited from large urban centers in 3 states in the US and may not be representative of HIV-infected men or women residing in non-urban areas. Finally, our study was done with mostly self-reported data and consequently could be subject to participant bias. However, highly trained interviewers using standardized, interview-based questionnaires were used to collect the most accurate data possible.

In summary, in light of recent and proposed funding cuts for ADAP and projected increase in demand of ADAP services, we provided evidence that this program was strongly

associated with better HAART medication utilization. We also found that populations that constitute the majority of ADAP enrollees, those with lower income and of African-American descent, had decreased HAART use compared to those with higher incomes and of non-African-American descent. As a result, state ADAPs should be continued in order to improve antiretroviral use in these at-risk populations. We found that state of study site was not associated with increased likelihood of HAART or antihypertensive use. However, ADAP enrollment was associated with an increased, but non-significant, likelihood of blood pressure medication utilization while Medicare and Medicaid were strongly associated with increased use. Therefore government-funded programs that provide prescription drug coverage, such as ADAP, may play a valuable role in promoting increased access and utilization of essential medications for chronic diseases for underserved HIV-infected women.

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TABLE 1

Baseline characteristics of the 1094 HAART-eligible HIV-infected women from California, Illinois, and New York sites of the Women's Interagency HIV Study

	Total	California	Illinois	New York	P
	n (%)	n (%)	n (%)	n (%)	
N	1094	439 (40.1)	168 (15.4)	487 (44.5)	
Age (years), n (%)					0.11
≤30	46 (4.2)	16 (3.6)	7 (4.2)	23 (4.7)	
31–40	281 (25.7)	121 (27.6)	48 (28.6)	112 (23.0)	
41–50	480 (43.9)	174 (39.6)	69 (41.1)	237 (48.7)	
>50	287 (26.2)	128 (29.2)	44 (26.2)	115 (23.6)	
Race/Ethnicity, n (%)					<0.001
	141 (12.9)	88 (20.1)	32 (19.05)	21 (4.3)	
Hispanic white	129 (11.8)	77 (17.5)	8 (4.8)	44 (9.0)	
African-American	600 (54.8)	161 (36.7)	117 (69.6)	322 (66.1)	
Other	224 (20.5)	113 (25.7)	11 (6.6)	100 (20.5)	
Level of education, n (%)					0.33
Less than high school diploma	439 (40.1)	182 (41.5)	61 (36.3)	196 (40.3)	
High school diploma	321 (29.4)	119 (27.2)	48 (28.6)	154 (31.6)	
Some college or more	333 (30.5)	137 (31.3)	59 (35.1)	137 (28.1)	
Not reported		1	0	0	
Living situation, n (%)					<0.001
Married, living with partner	337 (34.4)	167 (43.0)	47 (29.4)	123 (28.4)	
Not married, live alone	644 (65.6)	221 (57.0)	113 (70.6)	310 (71.6)	
Not reported		51	8	54	
Employment status, n (%)					0.23
Employed	383 (35.2)	165 (37.9)	52 (30.9)	166 (34.2)	
Not employed	706 (64.8)	270 (62.1)	116 (69.1)	320 (65.8)	
Not reported		4	0	1	
Average income per year					0.02

	Total	California	Illinois	New York	P
	n (%)	n (%)	n (%)	n (%)	
≤$12000	491 (50.4)	199 (52.0)	89 (56.0)	203 (46.9)	
$12000–$36000	352 (36.1)	138 (36.0)	41 (25.8)	173 (40.0)	
>$36000	132 (13.5)	46 (12.0)	29 (18.2)	57 (13.1)	
Not reported		56	9	54	
Health insurance					<0.001
Private or other	195 (17.8)	80 (18.2)	34 (20.2)	81 (16.6)	
Medicare	170 (15.5)	71 (16.2)	26 (15.5)	73 (15.0)	
Medicaid (Medi-Cal in CA)	543 (49.6)	167 (38.0)	79 (47.0)	297 (61.0)	
None	186 (17.0)	121 (27.6)	29 (17.3)	36 (7.4)	
ADAP enrollment					<0.001
Yes	264 (24.1)	188 (42.8)	23 (13.7)	53 (10.9)	
No	778 (71.1)	229 (52.2)	127 (75.6)	422 (86.7)	
Not reported	52 (4.8)	22 (5.0)	18 (10.7)	12 (2.4)	
CES-D[a] Scale score >15	407 (37.2)	178 (40.6)	85 (50.6)	144 (29.6)	<0.001
Illicit drug use[b] in the last 6 months	95 (8.7)	51 (11.6)	21 (12.6)	23 (4.7)	<0.001
Alcohol use in the last 6 months					0.01
0 drinks/week	701 (64.1)	276 (62.9)	107 (63.7)	318 (65.3)	
<3 drinks/week	267 (24.4)	98 (22.3)	37 (22.0)	132 (27.1)	
3–13 drinks/week	95 (8.7)	45 (10.3)	19 (11.3)	31 (6.4)	
>13 drinks/week	31 (2.8)	20 (4.5)	5 (3.0)	6 (1.2)	
Smoking in the last 6 months	427 (39.1)	148 (33.8)	76 (45.5)	203 (41.7)	0.01
Marijuana use in the last 6 months	142 (13.0)	67 (15.3)	27 (16.2)	48 (9.9)	0.02
CD4+ count (per mm^3), median (IQR)		486 (303–669)	432 (299–658)	462 (300–686)	
CD4+ count (per mm^3)					0.07
<200	139 (12.8)	56 (12.8)	15 (9.0)	68 (14.0)	
200–499	450 (41.3)	172 (39.2)	85 (50.9)	193 (39.8)	
>500	501 (45.9)	210 (48.0)	67 (40.1)	224 (46.2)	
Not reported		1	1	2	

	Total	California	Illinois	New York	P
	n (%)	n (%)	n (%)	n (%)	
Viral load, median (IQR)		80.0 (80–350)	80.0 (80–1700)	80.0 (80–1700)	
Viral load					0.34
≤80	671 (62.1)	287 (66.1)	97 (58.4)	287 (59.7)	
81–3999	205 (19.0)	79 (18.2)	34 (20.5)	92 (19.1)	
4000–49999	129 (11.9)	41 (9.5)	23 (13.9)	65 (13.5)	
>49999	76 (7.0)	27 (6.2)	12 (7.2)	37 (7.7)	
Not reported	13	5	2	6	
Type of antiretroviral regimen					0.33
HAART	806 (73.7)	338 (77.0)	120 (71.4)	348 (71.5)	
Combination therapy	14 (1.3)	6 (1.4)	1 (0.6)	7 (1.4)	
Monotherapy	6 (0.5)	2 (0.4)	0	4 (0.8)	
None	268 (24.5)	93 (21.2)	47 (28.0)	128 (26.3)	

[a] Center for Epidemiologic Studies Depression;

[b] Includes crack, cocaine, methadone, and/or heroin

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TABLE 2

Baseline characteristics of the 395 HAART- and antihypertensive medication-eligible HIV-infected women from California, Illinois, and New York sites of the Women's Interagency HIV Study

State	Total	California	Illinois	New York	P
	n (%)	n (%)	n (%)	n (%)	
N	395	145 (36.7)	74 (18.7)	176 (44.6)	
Age (years)					0.08
≤30	3 (0.8)	2 (1.4)	0 (0.0)	1 (0.6)	
31–40	47 (11.9)	17 (11.7)	15 (20.3)	15 (8.5)	
41–50	171 (43.3)	55 (37.9)	29 (39.2)	87 (49.4)	
>50	174 (44.0)	71 (49.0)	30 (40.5)	73 (41.5)	
Race/Ethnicity					<0.001
Non-Hispanic white	43 (10.9)	23 (15.9)	15 (20.3)	5 (2.8)	
Hispanic white	16 (4.0)	10 (6.9)	2 (2.7)	4 (2.3)	
African-American	270 (68.4)	89 (61.4)	51 (68.9)	130 (73.9)	
Other	66 (16.7)	23 (15.8)	6 (8.1)	37 (21.0)	
Level of education					0.86
Less than high school diploma	141 (35.7)	49 (33.8)	25 (33.8)	67 (38.1)	
High school diploma	131 (33.2)	48 (33.1)	24 (32.4)	59 (33.5)	
Some college or more	123 (31.1)	48 (33.1)	25 (33.8)	50 (28.4)	
Living situation					0.17
Married, living with partner	101 (27.1)	43 (31.2)	22 (30.6)	36 (22.2)	
Not married, live alone	271 (72.9)	95 (68.8)	50 (69.4)	126 (77.8)	
Not reported		7	2	14	
Employment status					0.34
Employed	109 (27.7)	34 (23.6)	24 (32.4)	51 (29.0)	
Not employed	285 (72.3)	110 (76.4)	50 (67.6)	125 (71.0)	
Not reported		1	-	-	
Average income per year					0.05
≤$12000	203 (54.9)	83 (61.0)	39 (54.2)	81 (50.0)	

State	Total	California	Illinois	New York	P
	n (%)	n (%)	n (%)	n (%)	
$12000–$36000	126 (34.1)	40 (29.4)	20 (27.8)	66 (40.7)	
>$36000	41 (11.0)	13 (9.6)	13 (18.0)	15 (9.3)	
Not reported		9	2		
Health insurance					0.03
Private or other	64 (16.2)	23 (15.9)	15 (20.3)	26 (14.8)	
Medicare	76 (19.2)	27 (18.6)	15 (20.3)	34 (19.3)	
Medicaid (Medi-Cal in CA)	218 (55.2)	72 (49.6)	38 (51.3)	108 (61.4)	
None	37 (9.4)	23 (15.9)	6 (8.1)	8 (4.5)	
ADAP enrollment					<0.001
Yes	74 (18.7)	47 (32.4)	9 (12.2)	18 (10.2)	
No	309 (78.2)	91 (62.8)	63 (85.1)	155 (88.1)	
Not reported	12 (3.1)	7 (4.8)	2 (2.7)	3 (1.7)	
CES-D[a] Scale score >15	158 (40.0)	68 (46.9)	37 (50.0)	53 (30.1)	0.001
Illicit drug use[b] in the last 6 months	45 (11.4)	22 (15.2)	10 (13.7)	13 (7.4)	0.07
Alcohol use in the last 6 months					0.41
0 drinks/week	277 (70.1)	94 (64.8)	53 (71.6)	130 (73.9)	
< 3 drinks/week	83 (21.0)	32 (22.1)	16 (21.6)	35 (19.9)	
3–13 drinks/week	25 (6.3)	14 (9.7)	3 (4.1)	8 (4.5)	
> 13 drinks/week	10 (2.5)	5 (3.4)	2 (2.7)	3 (1.7)	
Smoking in the last 6 months	163 (41.4)	64 (44.1)	31 (42.5)	68 (38.6)	0.60
Marijuana use in the last 6 months	52 (13.2)	25 (17.2)	12 (16.4)	15 (8.5)	0.05
Antihypertensive medication					0.75
Yes	313 (76.7)	109 (75.2)	59 (73.7)	135 (76.7)	
No	92 (23.3)	36 (24.8)	15 (20.3)	41 (23.3)	

[a] Center for Epidemiologic Studies Depression;

[b] Includes crack, cocaine, methadone, and/or heroin

TABLE 3

Unadjusted and adjusted logistic regression analyses for non-use of HAART among the 1094 HAART-eligible HIV-infected women from California, Illinois, and New York sites of the Women's Interagency HIV Study

Independent Variable	Sub-Category	Unadjusted Odds Ratio (95% CI)	P	Adjusted Odds Ratio** (95% CI)	P
Age (per 10 yrs)	-	**0.73 (0.62–0.86)**	**<0.001**	**0.74 (0.61–0.89)**	**<0.001**
Race/Ethnicity	African-American*	**1.0 (-)**	-	**1.0 (-)**	-
	Non-Hispanic white	**0.27 (0.16–0.46)**	**<0.001**	**0.21 (0.10–0.44)**	**<0.001**
	Hispanic white	**0.45 (0.28–0.74)**	**0.001**	**0.51 (0.29–0.92)**	**0.03**
	Other	**0.68 (0.48–0.97)**	**0.03**	0.87 (0.58–1.30)	0.50
Level of education	Less than high school*	1.0 (-)	-		
	High school diploma	0.83 (0.60–1.14)	0.25		
	Some college or more	0.81 (0.59–1.12)	0.21		
Living situation	Not married, live alone*	1.0 (-)	-		
	Married, living with partner	0.81 (0.60–1.10)	0.17		
Employment status	Employed*	**1.0 (-)**	-		
	Not employed	**1.38 (1.03–1.84)**	**0.03**		
Average income per year	<$12000*	**1.0 (-)**	-	**1.0 (-)**	-
	$12000–$36000	**0.72 (0.52–0.98)**	**0.04**	**0.70 (0.50–0.99)**	**0.05**
	>$36000	**0.58 (0.36–0.93)**	**0.02**	0.59 (0.34–1.01)	0.05
CES-D[a] Scale score	≤15*	**1.0 (-)**	-		
	>15	**1.40 (1.06–1.84)**	**0.02**		
Illicit drug use[b] in the last 6 months	No*	**1.0 (-)**	-		
	Yes	**1.91 (1.23–2.95)**	**0.003**		
Alcohol use in the last 6 months	0 drinks/week*	**1.0 (-)**	-	**1.0 (-)**	-
	<3 drinks/week	**1.31 (0.10–1.81)**	**0.09**	**1.45 (1.00–2.11)**	**0.05**
	3–13 drinks/week	**1.76 (1.11–2.78)**	**0.02**	**2.08 (1.19–3.65)**	**0.01**
	>13 drinks/week	**3.52 (1.70–7.28)**	**<0.001**	**3.75 (1.59–8.84)**	**0.003**
Smoking in the last 6 months	No*	**1.0 (-)**	-		

Independent Variable	Sub-Category	Unadjusted Odds Ratio (95% CI)	P	Adjusted Odds Ratio** (95% CI)	P
	Yes	**1.59 (1.21–2.09)**	**<0.001**		
Marijuana use in the last 6 months	No*	**1.0 (-)**	-		
	Yes	**1.46 (1.00–2.14)**	**0.05**		
Health insurance	Private or other*	**1.0 (-)**	-		
	Medicare	0.96 (0.57–1.62)	0.87		
	Medicaid	**1.87 (1.25–2.78)**	**0.002**		
	None	1.48 (0.91–2.39)	0.11		
Enrollment in ADAP	Yes*	**1.0 (-)**	-	**1.0 (-)**	-
	No	**2.47 (1.69–3.61)**	**<0.001**	**2.35 (1.49–3.71)**	**<0.001**
State	New York*	1.0 (-)	-	1.0 (-)	-
	California	0.75 (0.56–1.01)	0.05	1.18 (0.81–1.72)	0.38
	Illinois	1.00 (0.68–1.48)	0.99	1.08 (0.68–1.72)	0.74

[a] Center for Epidemiologic Studies Depression

[b] Includes crack, cocaine, methadone, and/or heroin

* Reference group

** Adjusted backward stepwise elimination logistic regression model

TABLE 4

Unadjusted and adjusted logistic regression analyses for non-use of antihypertensive use HAART among the HAART- and antihypertensive-eligible HIV-infected women from California, Illinois, and New York sites of the Women's Interagency HIV Study

Independent Variable	Sub-Category	Unadjusted Odds Ratio (95% CI)	P	Adjusted Odds Ratio** (95% CI)	P
Age (per 10 yrs)	-	1.00 (0.75–1.33)	0.10		
Race/Ethnicity	African-American*	**1.0 (-)**	-	**1.0 (-)**	-
	Non-Hispanic white	1.75 (0.84–3.64)	0.14	**2.36 (0.99–5.63)**	**0.05**
	Hispanic white	1.50 (0.47–4.86)	0.50	1.99 (0.54–7.35)	0.30
	Other	**3.12 (1.75–5.58)**	**<0.001**	**4.76 (2.48–9.14)**	**<0.001**
Level of education	Less than high school*	1.0 (-)	-		
	High school diploma	0.79 (0.45–1.39)	0.41		
	Some college or more	0.98 (0.56–1.71)	0.94		
Living situation	Not married, live alone*	1.0 (-)	-		
	Married, living with partner	0.75 (0.43–1.32)	0.32		
Employment status	Employed*	1.0 (-)	-		
	Not employed	1.17 (0.69–2.00)	0.56		
Average income per year	<$12000*	1.0 (-)	-	**1.0 (-)**	-
	$12000–$36000	0.81 (0.48–1.38)	0.44	0.67 (0.35–1.29)	0.23
	>$36000	0.84 (0.38–1.87)	0.67	**0.20 (0.06–0.71)**	**0.01**
CES-D[a] Scale score	≤15*	1.0 (-)	-		
	>15	1.01 (0.63–1.63)	0.96		
Illicit drug use[b] in the last 6 months	No*	1.0 (-)	-		
	Yes	1.22 (0.60–2.48)	0.58		
Alcohol use in the last 6 months	0 drinks/week*	1.0 (-)	-		
	<3 drinks/week	1.08 (0.61–1.91)	0.78		
	3–13 drinks/week	0.61 (0.20–1.84)	0.38		
	>13 drinks/week	0.36 (0.04–2.86)	0.33		
Smoking in the last 6 months	No*	1.0 (-)	-	1.0 (-)	-

Independent Variable	Sub-Category	Unadjusted Odds Ratio (95% CI)	P	Adjusted Odds Ratio** (95% CI)	P
	Yes	1.33 (0.83–2.13)	0.23	**1.80 (1.03–3.16)**	**0.04**
Marijuana use in the last 6 months	No*	1.0 (-)	-		
	Yes	0.65 (0.31–1.40)	0.27		
Health insurance	Private or other*	1.0 (-)	-	**1.0 (-)**	**-**
	Medicare	0.44 (0.20–1.01)	0.05	**0.22 (0.08–0.62)**	**0.004**
	Medicaid	0.69 (0.37–1.28)	0.24	**0.23 (0.09–0.60)**	**0.003**
	None	1.14 (0.48–2.72)	0.77	0.53 (0.13–2.14)	0.37
Enrollment in ADAP	Yes*	1.0 (-)	-	**1.0 (-)**	**-**
	No	1.48 (0.77–2.84)	0.24	**2.37 (0.93–6.03)**	**0.07**
State	New York*	1.0 (-)	-	1.0 (-)	-
	California	1.09 (0.65–1.18)	0.7491	1.03 (0.55–1.94)	0.64
	Illinois	0.84 (0.43–1.63)	0.6008	0.83 (0.39–1.78)	0.63

[a] Center for Epidemiologic Studies Depression

[b] Includes crack, cocaine, methadone, and/or heroin

* Reference group

** Adjusted backward stepwise elimination logistic regression model