

**Understanding the Disparity:
Predictors of Virologic Failure in
Women using HAART vary by
Race/Ethnicity**

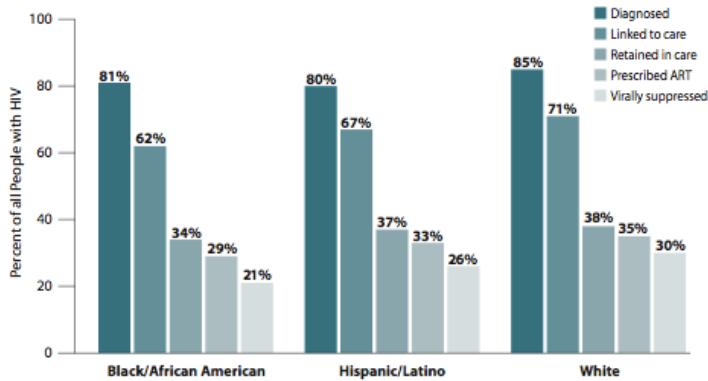
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Interagency HIV Study Collaborative Group



Background

- Racial/ethnic and gender disparities in HIV/AIDS-related morbidity and mortality have been well documented

The Gardner Cascade of HIV Care Stratified by Race/Ethnicity



The National HIV/AIDS Strategy:

To reduce HIV-related disparities and health inequities by addressing “the factors that influence disparate health outcomes” and being “mindful of the diversity and needs of the most affected communities”²

CDC. CDC Fact Sheet HIV in the United States: The Stages of Care. July 2012.
www.cdc.gov/nchhstp/newsroom/docs/2012/Stages-of-CareFactSheet-508.pdf

Study Population



- Women's Interagency HIV Study (WIHS), a multi-site, prospective, observational cohort, which includes six sites in Washington, DC, Brooklyn, NY, Bronx, NY, San Francisco, CA, Los Angeles, CA, and Chicago, IL
 - Semi-annual study visits include structured interviews, physical examinations, and laboratory specimen collection
- A nested cohort study conducted from April 1, 2006 to March 31, 2011
 - Inclusionary criteria: HIV-infected women that reported HAART use with a suppressed viral load occurring during our study period

Outcome and Predictors

- Outcome: HIV virologic failure
 - Defined as HIV RNA ≥ 200 copies/mL after confirmed suppression (< 80 copies/mL) on HAART
 - HAART defined according to Department of Health and Human Services guidelines³
- Adherence
- Predictors
 - Behavioral: alcohol and illicit drug use, cigarette smoking
 - Psychosocial: depressive symptoms (CESD)
 - Socioeconomic: annual household income
 - Healthcare-related: type of health insurance, ADAP participation

Statistical Methods

- Annual proportion of women experiencing virologic failure
 - Estimated using a series of annual, cross-sectional studies was used
- Estimated univariate (HR) and adjusted (aHR) hazard ratios and 95% confidence intervals
 - Discrete-time complementary log-log (clog-log) survival models
 - Time from baseline study visit (Oct 2005-Mar 2006) or viral suppression, whichever came later, to virologic failure
- Population attributable fractions (PAFs):
 - Estimated using the Rockhill's formula⁴ using the aHRs and the prevalence of the predictor among women with virologic failure
 - Interpretation: the proportion of failures that could be avoided if the predictor/exposure were eliminated or at the lowest exposure level⁵
 - Tool to highlight characteristics of women in which virologic failure is concentrated

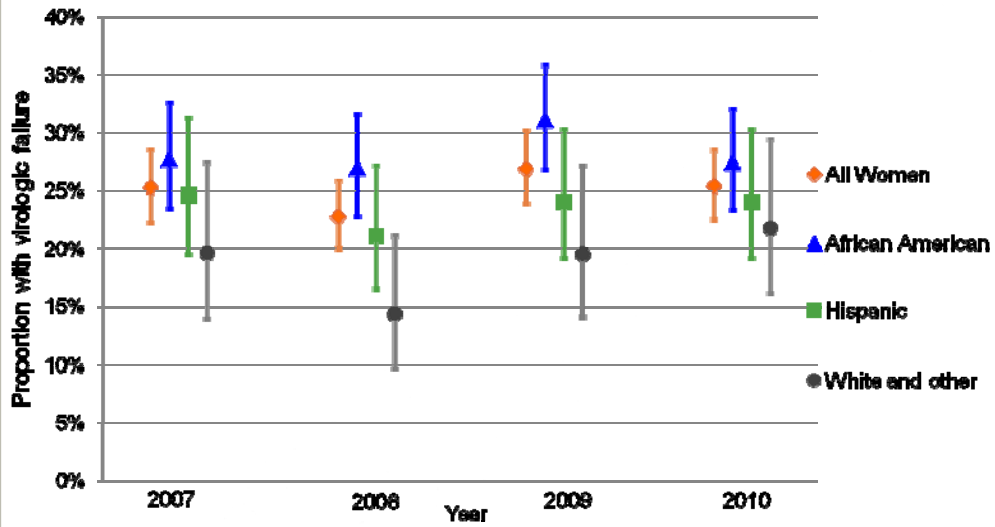
Results

Table 1 Characteristics of Women's Interagency HIV Study (WIHS) participants, by virologic failure, April 2006 - March 2011 (N=919)

Characteristic	N	Suppressed N=498		Virologic Failure N=424		p-value*	
		N	%	N	%		
Race/ethnicity							
Non-Hispanic African-American	243	49		241	57		
Hispanic	150	30		114	27	<0.001	
Non-Hispanic White and other	105	21		69	16		
Country of birth							
United States and territories	353	71		341	80	<0.001	
Other	141	29		83	20		
Age (years) (median/IQR)	45	(39-51)		43	(37-49)		<0.001
Currently employed							
Yes	205	41		155	37	0.122	
Drug use since last study visit							
Yes	61	13		37	21	<0.001	
Alcohol use since last study visit							
<3 drinks/week	459	93		368	87	<0.001	
>3 drinks/week	30	6		51	12		
Current cigarette status							
Yes	141	29		104	43	<0.001	
Type of health insurance							
Public	228	46		201	49	<0.001	
Private or other	127	26		69	16		
No insurance	84	17		60	14		
CD4 count (cells/mm³) (median/IQR)	543	(401-737)		451	(318-672)		<0.001

*Chi-square test for categorical variables and Wilcoxon rank-sum test for continuous variables
Percentages may not add to 100% due to missing data

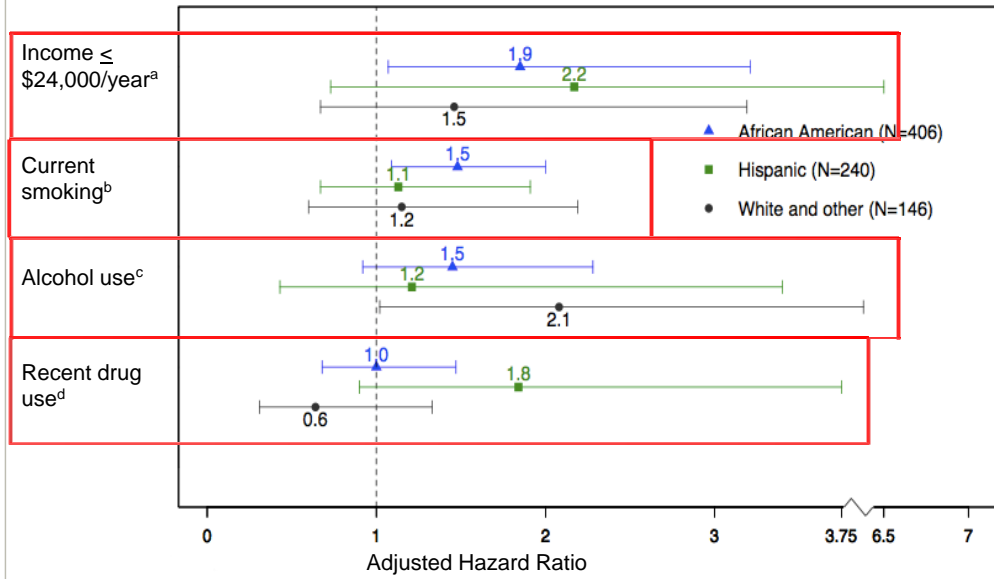
Figure 1 Annual proportion and 95% confidence intervals of women with virologic failure, by race/ethnicity, the Women's Interagency HIV Study (WIHS), 2007-2010



Number at risk (N)				
All women	621	731	796	814
Af. American	379	405	412	423
Hispanic	214	231	236	240
White/other	138	153	148	151

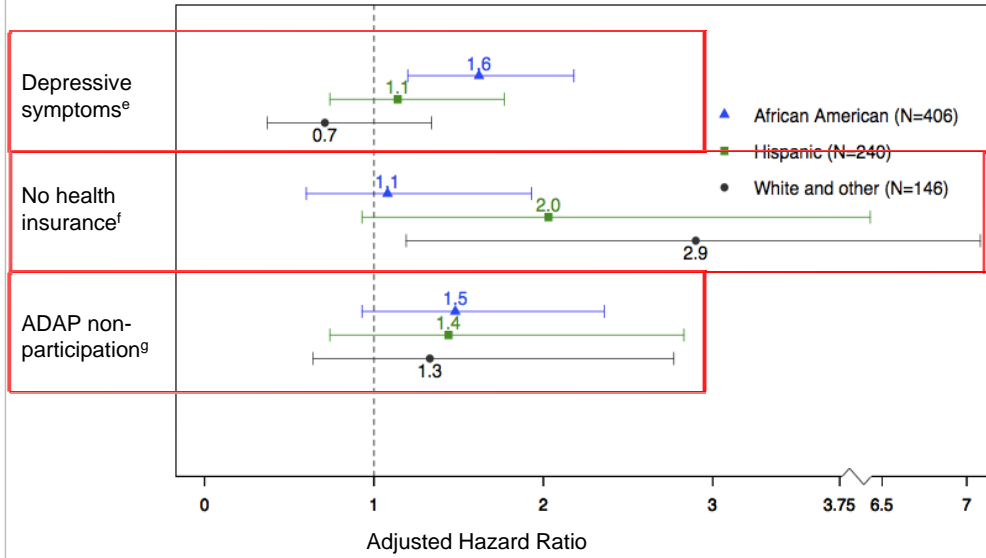
P-value for trends: All women, p=0.313; African American, p=0.713; Hispanic, p=0.889; white/other p=0.293.

Figure 2 Adjusted Hazard Ratios* (aHR) and 95% confidence intervals of virologic failure by race/ethnicity, Women's Interagency HIV Study, April 2006-March 2011 (N=792)



*Adjusted for all predictors in the figure as well as history of hepatitis C, country of birth, study center, age, CD4 count, clinical AIDS diagnosis, time since HAART initiation, and previous virologic failure, ^a Compared to annual income \geq \$36,001, ^b Compared to non-smoker, ^c \geq 3 drinks/week compared to $<$ 3 drinks/week, ^d Compared to non-use

Figure 2 Adjusted Hazard Ratios* (aHR) and 95% confidence intervals of virologic failure by race/ethnicity, Women's Interagency HIV Study, April 2006-March 2011 (N=792), continued

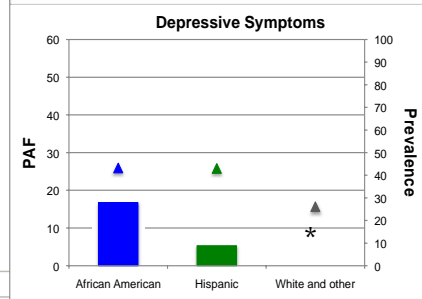
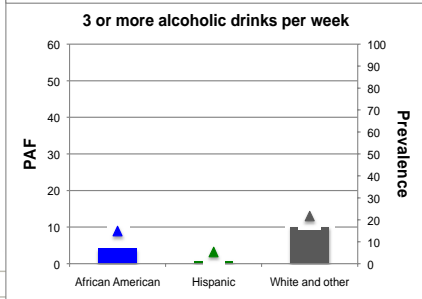
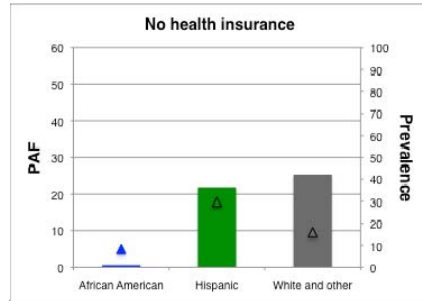
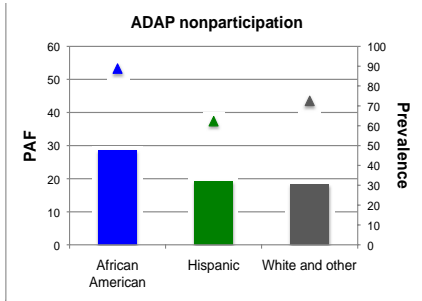


*Adjusted for all predictors in the figure as well as history of hepatitis C, country of birth, study center, age, CD4 count, clinical AIDS diagnosis, time since HAART initiation, and previous virologic failure, ^e Compared to no depressive symptoms, ^f Compared to public health insurance, ^g Compared to ADAP participation

Figure 3 Population attributable fractions (PAF) and prevalence of predictors stratified by race/ethnicity, Women's Interagency HIV Study (WIHS), April 2006 - March 2011 (N=792)

■ Population attributable fraction (PAF)
 ▲ Prevalence among women with virologic failure

* Negative PAF because of the protective effect of the predictor on virologic failure



Limitations

- Investigation of *first* virologic failure in study period
- Small sample sizes for Hispanic and white/other women, resulting in a reduction in power and challenging to discern predictors specific to these groups
- PAF interpretation depends on a causal relationship between the predictor and the outcome
 - We have not established causal relationships for our predictors

Conclusions

- Similar to national trends, racial/ethnic disparities in virologic failure exist among WIHS women
- Low income was a barrier to successful viral suppression in all racial/ethnic groups but may be more of a burden for African American and Hispanic women
- Nonparticipation in ADAP carried a moderate increase in risk of virologic failure in all groups
- Lack of health insurance associated with a large risk and PAF only in Hispanic and white/other women
- Depressive symptoms only associated with an increased risk in African American women
- Drug use and alcohol use do not seem to be large contributors to virologic failure

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