Linkage and Engagement in Care as Predictors of Achieving and Maintaining Viral Suppression

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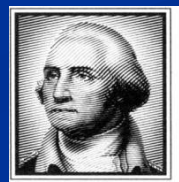

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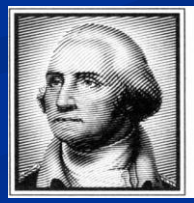

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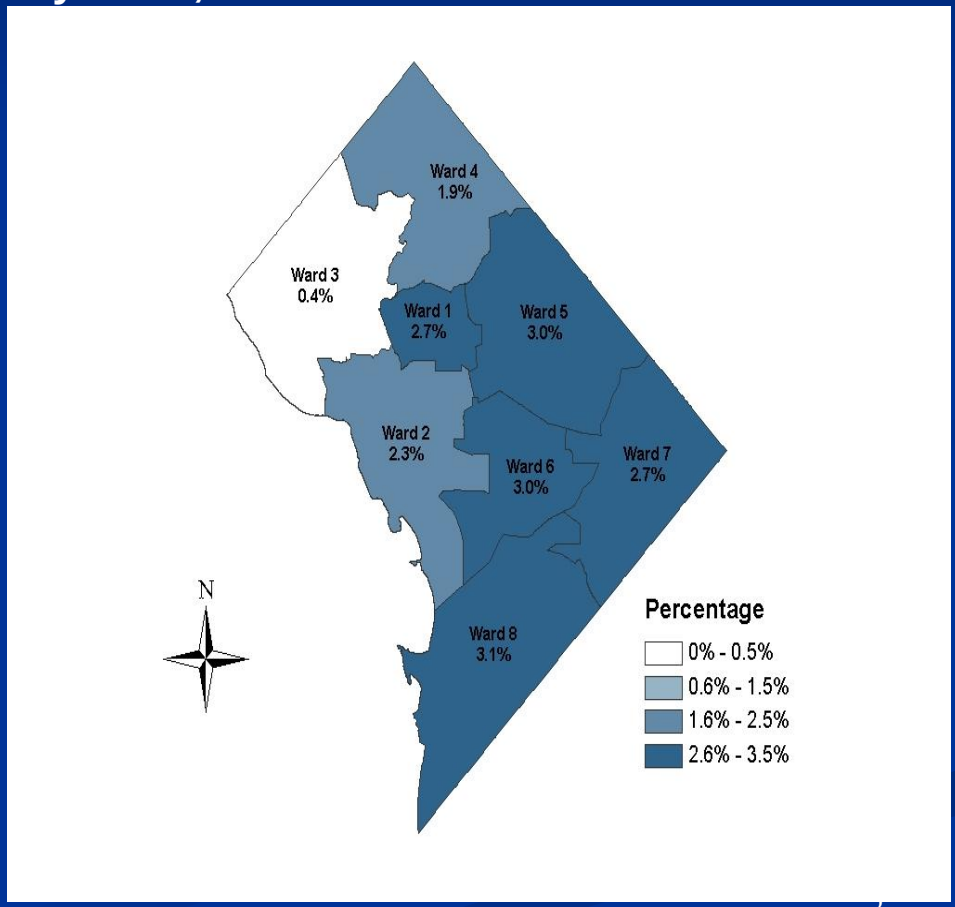
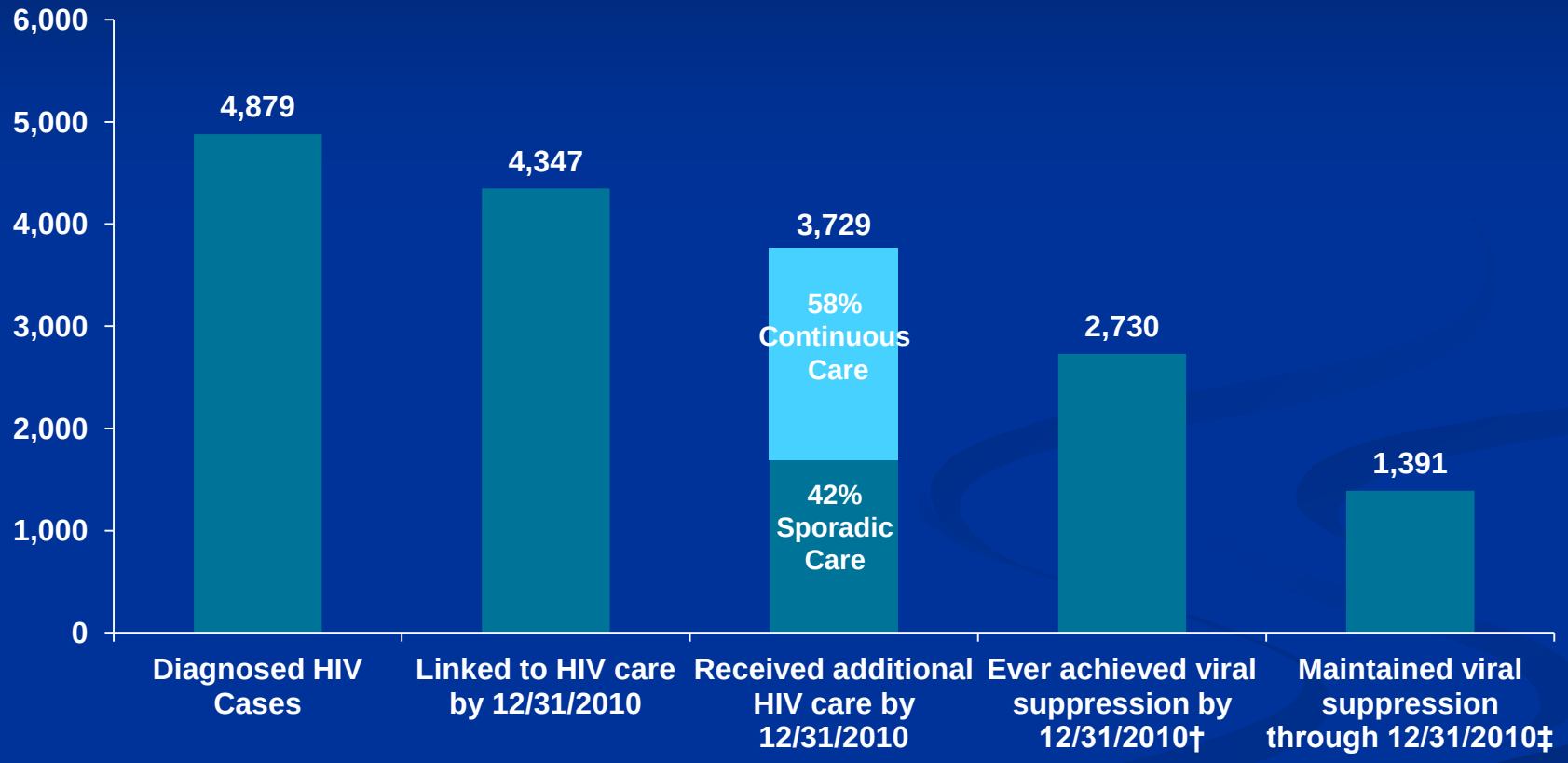
HIV/AIDS in the District of Columbia, 2009

- 16,721 reported living with HIV/AIDS in the District at the end of 2009
- Mean CVL 33,847 copies/ml
- DC is an intervention community in HPTN065 (TLC Plus Study)

Proportion of Persons Living with HIV/AIDS, by Ward, 2009



Continuum of Care for HIV Cases Diagnosed in the District of Columbia, 2005-2009



†At least one viral load test result prior to 12/31/2010 was ≤400 copies/mL.
‡All subsequent viral load test results were ≤400 copies/mL.

Objectives

- To further characterize rates of viral suppression (VS) as they relate to:
  - Linkage to care
  - Continuity of care
- To identify factors associated with achievement and maintenance of VS

Definitions

- Linkage to care:
  - Evidence of a CD4 or VL laboratory reported after initial diagnosis
- Continuous care:
  - 2 visits (CD4 or VL) within a 12-month period at least 3 months apart
- Viral Suppression (VS):
  - Viral load (VL) <400 copies/ml
- Maintenance of VS:
  - All VL <400 copies/ml over the 12-month period after achieving VS

Methods

- Identified newly diagnosed HIV-infected adults and adolescents diagnosed between 2006-2007 from DC DOH HIV/AIDS surveillance database
  - Inclusion criteria: Had an initial detectable VL followed by at least one additional VL test reported to DC DOH prior to 12/31/10
- Calculated time to and maintenance of VS
- Conducted uni-, bi-, multivariate analyses and Cox regression models to assess predictors of VS and maintenance

Demographics by Achievement of VS

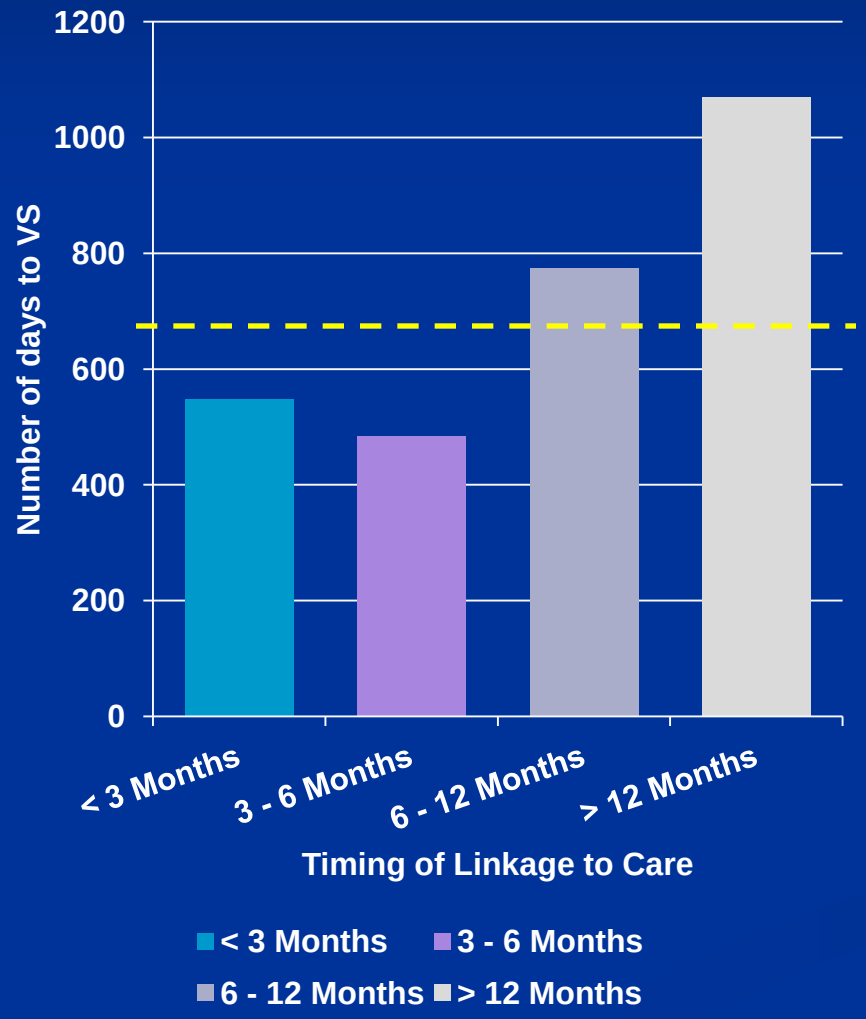
Characteristic	Achieved VS (n=648) N (%)	Did not Achieve VS (N=340) N (%)
Sex (Male)	444 (68.5)	240 (70.6)
Age at HIV Dx		
13-29	159 (24.5)	106 (31.2)
30-39	172 (26.5)	92(27.1)
40-49	195 (30.1)	104(30.6)
≥50	122 (18.8)	38 (11.2)
Race/Ethnicity (Black)	508 (78.4)	268 (78.8)
Risk Factor		
MSM	263 (40.6)	127 (37.4)
Heterosexual	201 (31.0)	114 (33.5)
Insurance (Public)	295 (45.5)	149 (43.8)

Clinical Characteristics by Achievement of VS

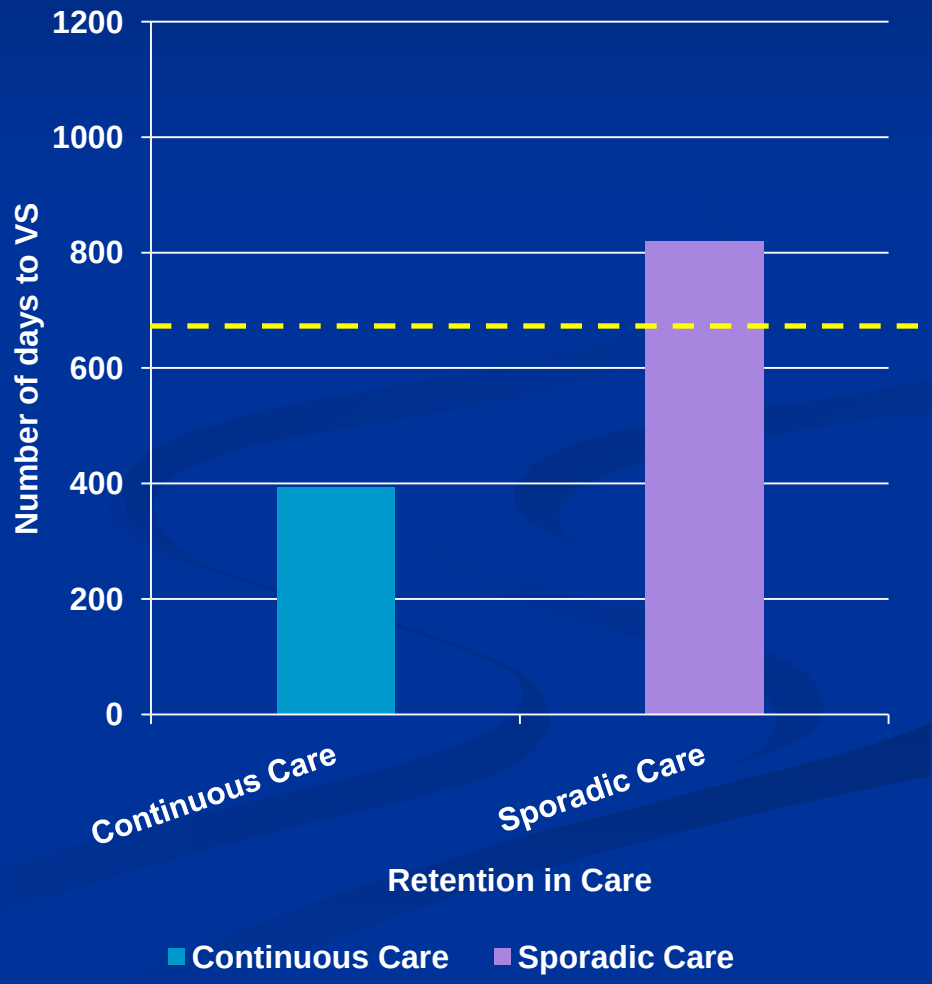
Characteristic	Achieved VS (n=648) N (%)	Did not Achieve VS (N=340) N (%)
Diagnostic Status		
HIV (not AIDS)	415 (64.2)	256 (75.3)
AIDS	231 (35.8)	84 (24.7)
CD4 Count at Diagnosis		
< 200	242 (37.6)	85 (25.4)
200 - 350	135 (21.0)	52 (15.5)
> 350	262 (40.8)	196 (58.5)
VL at Diagnosis (copies/ml)		
Mean VL	185,883.5	266,826.8
Median VL	22,583.5	18,444.0
Linkage to Care		
<3 Months	460 (71.0)	228 (67.1)
Annual VL test rate		
≥2 VL tests per year	288 (44.4)	33 (9.7)
<2 VL tests per year	360 (55.6)	307 (90.3)
Continuous Care		
Yes	207 (31.9)	76 (22.4)

Median Number of Days to Viral Suppression

Linkage to Care



Retention in Care



Predictors of Achieving Viral Suppression

Characteristic	OR	95%CI	aOR†	95%CI
Age at HIV Diagnosis (vs. 13-29)				
≥50	*2.14*	*(1.38, 3.32)*	*2.09*	*(1.29, 3.39)*
Risk Factor (vs. MSM)				
IDU	0.83	(0.56, 1.25)	*0.60*	*(0.37, 0.99)*
Heterosexual	0.85	(0.62, 1.16)	*0.61*	*(0.39, 0.93)*
Diagnostic Status (vs. HIV)				
AIDS	*1.70*	*(1.26, 2.28)*	*1.92*	*(1.34, 2.74)*
CD4 Count at Diagnosis (vs. >350)				
< 200	*2.13*	*(1.56, 2.81)*	--	
200 - 350	*1.94*	*(1.34, 2.81)*	--	
Annual VL test rate (vs. <2 tests)				
≥2 VL tests per year	*7.44*	*(5.03, 11.0)*	*8.02*	*(5.31, 12.11)*
Continuous Care (vs. no)				
Yes	*1.63*	*(1.20, 2.21)*	1.01	(0.71, 1.44)

Demographics by Maintenance of VS

Characteristic	Maintained VS (n=339) N (%)	Did not Maintain VS (n=200) N (%)
Sex (Male)	238 (70.2)	133 (66.5)
Race/Ethnicity (Black)	250 (73.8)	172 (86.0)
Age at HIV Diagnosis		
13-29	83 (24.5)	44 (22.0)
30-39	88 (26.0)	56 (28.0)
40-49	98 (28.9)	65 (32.5)
≥50	70 (20.7)	35 (17.5)
Risk Factor		
MSM	148 (43.7)	72 (36.0)
Heterosexual	96 (28.3)	70 (35.0)
Insurance (Public)	139 (41.0)	112 (56.0)

Clinical Characteristics by Maintenance of VS

Characteristic	Maintained Viral Suppression (n=339) N (%)	Did not Maintain Viral Suppression (n=200) N (%)
Diagnostic Status		
HIV (not AIDS)	224 (66.1)	116 (58.6)
AIDS	115 (33.9)	82 (41.4)
Annual VL test rate after suppression		
At least 2 VL tests per year	188 (55.5)	104 (52.0)
Less than 2 VL tests per year	151 (44.5)	96 (48.0)
Continuous Care (after initial viral suppression)		
Yes	122 (45.9)	70 (40.5)
No	144 (54.1)	103 (59.5)

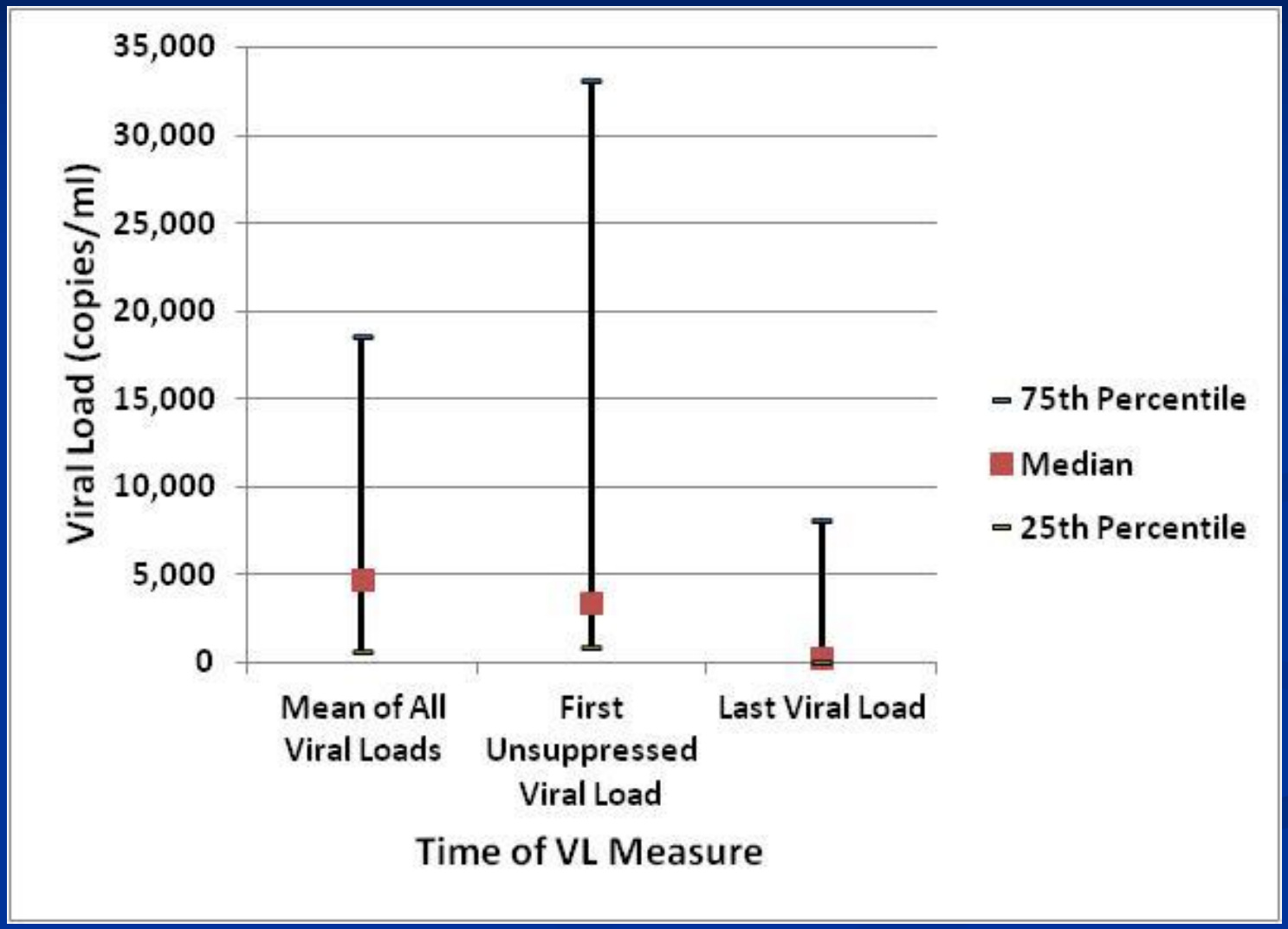
Predictors of Maintenance of VS

Characteristic	OR	95%CI	aOR†	95%CI
Race/Ethnicity (vs. White)				
Black	*0.39*	*(0.22, 0.70)*	*0.40*	*(0.19, 0.81)*
Hispanic	0.59	(0.23, 1.49)	*0.34*	*(0.12, 0.97)*
Insurance (vs. Private)				
Public	*0.50*	*(0.31, 0.81)*	0.60	(0.35, 1.04)
Diagnostic Status (vs. HIV)				
AIDS	0.73	(0.51, 1.04)	0.95	(0.62, 1.45)
Annual VL test rate after suppression (vs. <2 tests)				
≥2 VL tests per year	1.15	(0.81, 1.63)	1.15	(0.76, 1.75)
Continuous Care (after initial viral suppression) (vs. no)				
Yes	1.25	(0.85, 1.84)	1.19	(0.78, 1.81)

Adjusted Cox Proportional Hazard Ratios

Characteristic	Adjusted Hazard Ratio	95% CI
Sex (vs. Female)		
Male	*1.24*	*1.02, 1.51*
Race/Ethnicity (vs. White)		
Other races	*1.37*	*1.06, 1.77*
Diagnostic Status (vs. HIV)		
AIDS	*0.82*	*0.68, 0.97*
Annual VL test rate after suppression (vs. <2 tests)		
≥2 VL tests per year	0.89	0.75, 1.06

VLs among Those Not Maintaining VS



Limitations

- Unable to determine actual number of patient encounters
  - Used routinely reported lab data as a proxy
  - All laboratories report to surveillance system
- Do not have ARV data to accompany this analysis
  - Assumed VL <400 (undetectable VL) indicated viral suppression

Conclusions

- More rapid linkage to care and retention in continuous care led to more rapid achievement of VS
- Continuity of care was a predictor of achieving VS but was not for maintaining VS
- Many of those persons not maintaining VS were able to achieve VS by the end of the study period
- Results support the test and treat approach and the importance of engaging persons in care to reduce individual and population-level viral suppression

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