

SUPPLEMENT

Combined estimation of disease progression and retention on antiretroviral therapy among treated individuals with HIV in the USA: a modelling study

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Sponsoring Agencies

Agency for Healthcare Research and Quality, Rockville, Maryland (Fred Hellinger, Ph.D., John Fleishman, Ph.D.)
Health Resources and Services Administration, Rockville, Maryland (Robert Mills, Ph.D.)

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Supplement Table 1. Characteristics of the HIV Research Network included and excluded study participants.

Characteristics	Total N=38,472 (100%)	Included n=32,242 (83.8%)	Excluded		
			Sub-total n=6,230 (16.2%)	Missing covariates n=2,854 (7.4%)	Single observation* n=3,376 (8.8%)
Age at study entry (Median (IQR))	44.2 [34.5, 51.1]	44.4 [35.0, 51.1]	43.1 [32.0, 50.7]	44.7 [34.8, 51.8]	41.2 [30.6, 49.7]
Follow-up in years (Median (IQR))	4.3 [2.0, 6.0]	4.9 [2.6, 6.0]	1.2 [0.5, 3.6]	3.8 [2.0, 5.5]	0.6 [0.3, 1.0]
Female	9,250 (24.0%)	7,937 (24.6%)	1,313 (21.1%)	689 (24.1%)	624 (18.5%)
Male	29,222 (76.0%)	24,305 (75.4%)	4,917 (78.9%)	2,165 (75.9%)	2,752 (81.5%)
Region					
<i>Northeast</i>	17,024 (44.3%)	13,563 (42.1%)	3,461 (55.6%)	1,834 (64.3%)	1,627 (48.2%)
<i>South</i>	15,091 (39.2%)	13,345 (41.4%)	1,746 (28.0%)	523 (18.3%)	1,223 (36.2%)
<i>West</i>	6,357 (16.5%)	5,334 (16.5%)	1,023 (16.4%)	497 (17.4%)	526 (15.6%)
Race/ethnicity					
<i>Black</i>	17,076 (44.7%)	14,565 (45.2%)	2,511 (42.0%)	1,081 (40.4%)	1,430 (43.2%)
<i>Hispanic / Latino</i>	8,924 (23.3%)	7,496 (23.2%)	1,428 (23.9%)	731 (27.3%)	697 (21.1%)
<i>non-Hispanic white / others</i>	12,227 (32.0%)	10,181 (31.6%)	2,046 (34.2%)	865 (32.3%)	1,181 (35.7%)
HIV risk group					
<i>MSM</i>	18,317 (49.0%)	15,595 (48.4%)	2,722 (52.7%)	1,012 (51.0%)	1,710 (53.8%)
<i>PWID</i>	3,708 (9.9%)	3,278 (10.2%)	430 (8.3%)	186 (9.4%)	244 (7.7%)
<i>MWID</i>	1,070 (2.9%)	951 (2.9%)	119 (2.3%)	43 (2.2%)	76 (2.4%)
<i>HET</i>	14,312 (38.3%)	12,418 (38.5%)	1,894 (36.7%)	743 (37.4%)	1,151 (36.2%)
Year of diagnosis					
≤1996	10,564 (28.0%)	9,210 (28.6%)	1,354 (24.8%)	695 (30.8%)	659 (20.6%)
1997-2006	14,243 (37.8%)	12,636 (39.2%)	1,607 (29.4%)	810 (35.9%)	797 (24.9%)
2007-2015	12,898 (34.2%)	10,396 (32.2%)	2,502 (45.8%)	754 (33.4%)	1,748 (54.6%)
Year of ART initiation					
≤1996	2,078 (5.4%)	1,880 (5.8%)	198 (3.2%)	156 (5.5%)	42 (1.2%)
1997-2006	9,940 (25.8%)	9,416 (29.2%)	524 (8.4%)	329 (11.5%)	195 (5.8%)
2007-2015	15,940 (41.4%)	13,325 (41.3%)	2,615 (42.0%)	807 (28.3%)	1,808 (53.6%)
Unknown	10,514 (27.3%)	7,621 (23.6%)	2,893 (46.4%)	1,562 (54.7%)	1,331 (39.4%)
No prior ART utilization at study entry	10,152 (26.6%)	8,342 (25.9%)	1,810 (30.5%)	454 (17.7%)	1,356 (40.2%)
Year of enrollment at HIVRN clinics					
≤1996	2,034 (5.3%)	1,881 (5.8%)	153 (2.5%)	119 (4.2%)	34 (1.0%)
1997-2006	12,501 (32.5%)	11,769 (36.5%)	732 (11.8%)	528 (18.5%)	204 (6.0%)
2007-2015	23,935 (62.2%)	18,591 (57.7%)	5,344 (85.8%)	2,206 (77.3%)	3,138 (93.0%)
CD4 cell count at diagnosis					
≥500	2,937 (7.6%)	2,491 (7.7%)	446 (7.2%)	102 (3.6%)	344 (10.2%)
200-499	4,997 (13.0%)	4,447 (13.8%)	550 (8.8%)	154 (5.4%)	396 (11.7%)
<200	4,057 (10.6%)	3,648 (11.3%)	409 (6.6%)	146 (5.1%)	263 (7.8%)
Unknown	26,481 (68.8%)	21,656 (67.2%)	4,825 (77.4%)	2,452 (85.9%)	2,373 (70.3%)
CD4 cell count at ART initiation					
≥500	3,667 (9.5%)	3,011 (9.3%)	656 (10.5%)	155 (5.4%)	501 (14.8%)
200-499	8,085 (21.0%)	7,211 (22.4%)	874 (14.0%)	239 (8.4%)	635 (18.8%)
<200	5,938 (15.4%)	5,363 (16.6%)	575 (9.2%)	216 (7.6%)	359 (10.6%)
Unknown	20,782 (54.0%)	16,657 (51.7%)	4,125 (66.2%)	2,244 (78.6%)	1,881 (55.7%)
Status at end of study					
<i>Dead</i>	1,484 (3.9%)	1,325 (4.1%)	159 (2.6%)	100 (3.5%)	59 (1.7%)
<i>Lost to follow-up</i>	6,244 (16.2%)	4,268 (13.2%)	1,976 (31.7%)	504 (17.7%)	1,472 (43.6%)

MSM: men who have sex with men; PWID: people who inject drugs; MWID: MSM who inject drugs;

HET: heterosexual; ART: Antiretroviral treatment; HIVRN: HIV Research Network;

CD4: CD4+ T-lymphocyte cell count per μL .

* Single observed disease status measurement

Supplement Table 2. Multivariate multi-state Markov model results of disease progression during ART, mortality and ART engagement from the full study sample (N=32,242)

Transitions	HET female		MSM	Black	Hispanic/Latino	PWID	No prior ART*	Age	Time since dx	log(pVL)	South	West
	Reference	HET male		non-Hispanic white/others		non-PWID	Prior ART	per 10 years	per year	per unit	Northeast	
	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)
CD4 improvement during ART												
<200 to 200-499	1.37 (1.24,1.51)	1.25 (1.14,1.37)	1.08 (0.98,1.19)	1.06 (0.95,1.18)	0.98 (0.88,1.10)	1.39 (1.26,1.53)	1.02 (0.99,1.06)	0.99 (0.98,1.00)	0.96 (0.95,0.98)	1.16 (1.07,1.26)	1.05 (0.94,1.17)	
200-499 to ≥500	1.35 (1.26,1.45)	1.10 (1.03,1.18)	0.98 (0.92,1.05)	0.93 (0.87,1.00)	0.97 (0.90,1.05)	1.31 (1.22,1.40)	0.92 (0.90,0.94)	0.99 (0.99,1.00)	0.98 (0.96,0.99)	0.85 (0.80,0.89)	0.84 (0.78,0.90)	
CD4 deterioration during ART												
≥500 to 200-499	0.71 (0.65,0.77)	0.85 (0.79,0.91)	1.13 (1.06,1.22)	1.18 (1.09,1.27)	1.23 (1.13,1.33)	0.86 (0.78,0.94)	1.03 (1.00,1.06)	1.01 (1.00,1.01)	1.08 (1.07,1.10)	1.18 (1.11,1.26)	1.18 (1.09,1.28)	
200-499 to <200	1.12 (1.00,1.26)	0.82 (0.74,0.92)	1.11 (0.99,1.25)	1.02 (0.90,1.15)	1.23 (1.10,1.38)	0.84 (0.73,0.95)	1.00 (0.96,1.05)	1.02 (1.02,1.03)	1.19 (1.17,1.21)	1.01 (0.91,1.11)	1.04 (0.92,1.19)	
ART dropout												
≥500 to off-ART	1.04 (0.95,1.12)	0.88 (0.81,0.95)	0.97 (0.90,1.04)	0.73 (0.67,0.80)	1.36 (1.25,1.49)	1.10 (1.00,1.20)	0.88 (0.86,0.91)	1.01 (1.00,1.01)	0.98 (0.97,1.00)	2.45 (2.29,2.62)	1.66 (1.51,1.82)	
200-499 to off-ART	1.14 (1.04,1.23)	0.89 (0.82,0.96)	1.12 (1.03,1.21)	0.91 (0.83,1.00)	1.45 (1.34,1.58)	0.92 (0.84,1.01)	0.83 (0.81,0.86)	1.00 (1.00,1.01)	1.01 (1.00,1.03)	1.95 (1.81,2.10)	1.41 (1.27,1.56)	
<200 to off-ART	1.00 (0.89,1.13)	0.91 (0.82,1.02)	1.23 (1.09,1.39)	0.89 (0.77,1.03)	1.42 (1.26,1.61)	0.73 (0.64,0.84)	0.89 (0.85,0.93)	1.00 (0.99,1.01)	1.03 (1.01,1.05)	1.91 (1.71,2.13)	1.29 (1.10,1.51)	
ART re-initiation												
Off-ART to ≥500 on-ART	1.39 (1.27,1.52)	1.25 (1.14,1.38)	1.02 (0.94,1.12)	1.20 (1.08,1.32)	0.88 (0.79,0.96)	1.14 (1.03,1.26)	1.09 (1.05,1.13)	1.00 (0.99,1.00)	0.86 (0.84,0.87)	1.30 (1.21,1.41)	0.49 (0.43,0.55)	
Off-ART to 200-499 on-ART	1.02 (0.93,1.11)	1.02 (0.93,1.12)	1.16 (1.05,1.27)	1.37 (1.23,1.52)	1.02 (0.93,1.12)	0.86 (0.78,0.96)	1.04 (1.01,1.08)	1.00 (0.99,1.00)	1.04 (1.02,1.05)	1.43 (1.32,1.55)	0.59 (0.52,0.67)	
Off-ART to <200 on-ART	0.81 (0.73,0.90)	0.82 (0.74,0.91)	1.39 (1.24,1.57)	1.55 (1.36,1.77)	0.94 (0.84,1.05)	0.60 (0.52,0.68)	1.03 (0.99,1.08)	1.00 (0.99,1.01)	1.24 (1.22,1.26)	1.79 (1.62,1.99)	0.94 (0.80,1.09)	
Mortality												
≥500 to death	0.77 (0.51,1.15)	0.80 (0.53,1.20)	0.88 (0.61,1.26)	0.50 (0.31,0.83)	2.31 (1.62,3.29)	0.76 (0.42,1.36)	1.57 (1.34,1.84)	1.01 (0.98,1.03)	1.03 (0.94,1.12)	1.24 (0.89,1.73)	1.05 (0.68,1.63)	
200-499 to death	1.01 (0.75,1.38)	0.70 (0.51,0.95)	0.81 (0.60,1.08)	0.54 (0.38,0.78)	1.56 (1.18,2.06)	0.91 (0.60,1.36)	1.85 (1.64,2.10)	1.02 (1.00,1.04)	1.03 (0.98,1.09)	1.12 (0.86,1.46)	1.28 (0.93,1.76)	
<200 to death	1.08 (0.85,1.37)	1.12 (0.90,1.40)	0.90 (0.72,1.13)	0.77 (0.59,1.01)	1.61 (1.30,2.00)	0.93 (0.72,1.21)	1.48 (1.34,1.63)	1.00 (0.98,1.01)	1.08 (1.04,1.12)	1.93 (1.56,2.40)	1.37 (1.02,1.84)	
Off-ART to death	1.34 (0.80,2.22)	1.21 (0.70,2.08)	0.63 (0.39,1.01)	0.74 (0.41,1.33)	1.36 (0.86,2.16)	0.75 (0.36,1.54)	2.05 (1.68,2.51)	1.00 (0.97,1.03)	1.16 (1.07,1.25)	1.15 (0.76,1.76)	0.38 (0.18,0.80)	

Bold indicates statistically significant adjusted hazard ratios at p<0.05

ART: Antiretroviral treatment; CD4: CD4 T-lymphocyte cell count per µL; dx: Diagnosis; aHR: adjusted hazard ratio; CI: confidence interval.

HET: heterosexual; MSM: men who have sex with men; PWID: people who inject drugs.

* No prior ART utilization at study entry compared to prior ART utilization at study entry.

Supplement Table 2A. Multivariate multi-state Markov model results of disease progression during ART, mortality and ART engagement from the northeast region study sample (n=13,563)

Reference	HET female	MSM	Black	Hispanic/Latino	PWID	No prior ART*	Age	Time since dx	log(pVL)
	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	per 10 years	per year	per unit
Transitions									
CD4 improvement during ART									
<200 to 200-499	1.37 (1.17,1.61)	1.45 (1.23,1.70)	1.11 (0.93,1.32)	1.13 (0.93,1.36)	0.94 (0.79,1.13)	1.25 (1.03,1.52)	1.01 (0.94,1.08)	0.99 (0.98,1.00)	0.95 (0.92,0.97)
200-499 to ≥500	1.25 (1.12,1.40)	1.13 (1.02,1.25)	1.00 (0.91,1.11)	1.05 (0.95,1.16)	0.97 (0.86,1.09)	1.40 (1.26,1.57)	0.96 (0.93,1.00)	0.99 (0.99,1.00)	0.98 (0.96,0.99)
CD4 deterioration during ART									
≥500 to 200-499	0.72 (0.64,0.82)	0.85 (0.75,0.95)	1.26 (1.13,1.41)	1.25 (1.11,1.40)	1.26 (1.11,1.42)	0.81 (0.70,0.93)	1.04 (0.99,1.08)	1.01 (1.00,1.02)	1.10 (1.07,1.12)
200-499 to <200	1.16 (0.97,1.38)	0.79 (0.66,0.95)	1.20 (0.99,1.45)	1.08 (0.88,1.32)	1.27 (1.07,1.52)	0.70 (0.55,0.89)	1.00 (0.93,1.07)	1.02 (1.01,1.03)	1.20 (1.17,1.24)
ART dropout									
≥500 to off-ART	0.96 (0.82,1.11)	0.61 (0.52,0.71)	1.00 (0.87,1.16)	1.03 (0.89,1.20)	1.11 (0.93,1.32)	0.88 (0.73,1.05)	0.83 (0.79,0.88)	1.00 (0.99,1.01)	1.01 (0.98,1.04)
200-499 to off-ART	1.16 (0.98,1.36)	0.76 (0.64,0.90)	1.02 (0.86,1.20)	1.12 (0.94,1.33)	1.06 (0.89,1.26)	0.99 (0.82,1.20)	0.85 (0.81,0.91)	0.99 (0.98,1.00)	1.03 (1.00,1.06)
<200 to off-ART	0.85 (0.68,1.06)	1.07 (0.86,1.34)	1.21 (0.93,1.58)	1.33 (1.00,1.76)	1.22 (0.97,1.55)	0.70 (0.50,0.97)	0.91 (0.83,1.00)	0.99 (0.97,1.00)	1.04 (1.00,1.08)
ART re-initiation									
Off-ART to ≥500 on-ART	1.39 (1.19,1.61)	1.22 (1.04,1.44)	1.13 (0.97,1.33)	1.51 (1.29,1.78)	0.85 (0.72,1.00)	0.95 (0.77,1.17)	1.12 (1.06,1.19)	0.99 (0.98,1.00)	0.87 (0.85,0.89)
Off-ART to 200-499 on-ART	1.05 (0.90,1.24)	1.01 (0.86,1.20)	1.13 (0.95,1.35)	1.51 (1.26,1.81)	0.91 (0.76,1.08)	0.62 (0.48,0.79)	1.03 (0.97,1.10)	0.99 (0.98,1.00)	1.06 (1.03,1.08)
Off-ART to <200 on-ART	0.86 (0.69,1.06)	0.79 (0.63,0.98)	1.63 (1.25,2.12)	1.58 (1.19,2.09)	0.81 (0.64,1.03)	0.49 (0.35,0.68)	1.06 (0.97,1.16)	0.99 (0.98,1.01)	1.25 (1.21,1.30)
Mortality									
≥500 to death	0.93 (0.52,1.65)	0.49 (0.25,0.95)	0.62 (0.36,1.07)	0.32 (0.16,0.66)	2.12 (1.22,3.67)	0.55 (0.21,1.45)	1.71 (1.34,2.18)	0.99 (0.95,1.02)	1.07 (0.94,1.21)
200-499 to death	0.89 (0.55,1.44)	0.60 (0.36,1.01)	0.97 (0.59,1.58)	0.62 (0.36,1.09)	1.57 (1.01,2.47)	1.21 (0.65,2.28)	1.62 (1.33,1.98)	1.02 (0.99,1.05)	1.01 (0.92,1.11)
<200 to death	1.02 (0.66,1.56)	1.21 (0.76,1.93)	0.66 (0.43,1.01)	0.65 (0.40,1.05)	2.45 (1.66,3.62)	0.55 (0.26,1.16)	1.80 (1.47,2.20)	0.97 (0.95,1.00)	1.04 (0.96,1.12)
Off-ART to death	1.53 (0.71,3.28)	1.17 (0.49,2.81)	0.64 (0.30,1.38)	0.70 (0.30,1.60)	1.05 (0.49,2.24)	0.74 (0.19,2.88)	1.95 (1.45,2.61)	1.03 (0.99,1.08)	1.07 (0.94,1.22)

Bold indicates statistically significant adjusted hazard ratios at p<0.05

ART: Antiretroviral treatment; CD4: CD4 T-lymphocyte cell count per μL; dx: Diagnosis; aHR: adjusted hazard ratio; CI: confidence interval.

HET: heterosexual; MSM: men who have sex with men; PWID: people who inject drugs.

* No prior ART utilization at study entry compared to prior ART utilization at study entry.

Supplement Table 2B. Multivariate multi-state Markov model results of disease progression during ART, mortality and ART engagement from the south region study sample (n=13,345)

Reference	HET female	MSM	Black	Hispanic/Latino	PWID	No prior ART*	Age	Time since dx	log(pVL)
	<i>HET male</i>		<i>non-Hispanic white/others</i>		<i>non-PWID</i>	<i>Prior ART</i>	<i>per 10 years</i>	<i>per year</i>	<i>per unit</i>
Transitions	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)
CD4 improvement during ART									
<200 to 200-499	1.38 (1.20,1.58)	1.15 (1.01,1.30)	1.26 (1.09,1.45)	1.18 (1.00,1.39)	1.02 (0.87,1.20)	1.49 (1.31,1.69)	1.01 (0.96,1.07)	1.00 (0.99,1.01)	0.96 (0.94,0.99)
200-499 to ≥500	1.45 (1.30,1.60)	1.08 (0.98,1.20)	1.04 (0.94,1.15)	0.88 (0.78,1.00)	0.91 (0.80,1.04)	1.21 (1.09,1.33)	0.89 (0.85,0.92)	1.00 (0.99,1.00)	0.97 (0.95,0.99)
CD4 deterioration during ART									
≥500 to 200-499	0.66 (0.59,0.74)	0.85 (0.76,0.95)	1.01 (0.91,1.13)	1.16 (1.01,1.32)	1.22 (1.06,1.39)	0.89 (0.78,1.02)	0.99 (0.95,1.04)	1.00 (0.99,1.01)	1.09 (1.06,1.11)
200-499 to <200	1.14 (0.97,1.36)	0.87 (0.73,1.02)	0.96 (0.81,1.13)	0.85 (0.69,1.04)	1.20 (1.00,1.45)	0.92 (0.77,1.10)	0.98 (0.92,1.05)	1.03 (1.02,1.04)	1.19 (1.16,1.23)
ART dropout									
≥500 to off-ART	1.06 (0.96,1.18)	0.99 (0.89,1.10)	0.95 (0.87,1.05)	0.57 (0.49,0.65)	1.44 (1.29,1.61)	1.12 (1.00,1.26)	0.93 (0.90,0.97)	1.02 (1.01,1.02)	0.97 (0.95,0.99)
200-499 to off-ART	1.09 (0.98,1.21)	0.90 (0.81,1.00)	1.14 (1.02,1.26)	0.80 (0.70,0.91)	1.68 (1.51,1.88)	0.89 (0.80,1.00)	0.84 (0.80,0.87)	1.01 (1.00,1.02)	1.02 (1.00,1.04)
<200 to off-ART	1.11 (0.95,1.29)	0.90 (0.77,1.04)	1.30 (1.11,1.53)	0.77 (0.62,0.95)	1.50 (1.28,1.76)	0.69 (0.59,0.82)	0.90 (0.84,0.96)	1.00 (0.99,1.01)	1.02 (1.00,1.05)
ART re-initiation									
Off-ART to ≥500 on-ART	1.36 (1.20,1.53)	1.35 (1.19,1.53)	0.99 (0.89,1.11)	1.04 (0.89,1.22)	0.89 (0.78,1.01)	1.34 (1.18,1.53)	1.09 (1.04,1.15)	1.01 (1.00,1.01)	0.84 (0.82,0.86)
Off-ART to 200-499 on-ART	1.03 (0.91,1.15)	1.05 (0.93,1.18)	1.16 (1.03,1.31)	1.34 (1.15,1.56)	1.07 (0.95,1.20)	1.05 (0.92,1.19)	1.06 (1.01,1.11)	1.00 (0.99,1.00)	1.02 (1.00,1.04)
Off-ART to <200 on-ART	0.82 (0.71,0.93)	0.84 (0.74,0.96)	1.33 (1.16,1.54)	1.56 (1.30,1.87)	0.97 (0.84,1.12)	0.68 (0.58,0.79)	1.02 (0.96,1.08)	1.00 (0.99,1.01)	1.23 (1.20,1.26)
Mortality									
≥500 to death	0.66 (0.35,1.24)	1.26 (0.70,2.29)	1.18 (0.66,2.09)	0.77 (0.34,1.74)	1.61 (0.89,2.90)	0.89 (0.38,2.09)	1.46 (1.15,1.87)	1.04 (1.00,1.08)	1.04 (0.90,1.19)
200-499 to death	0.99 (0.60,1.61)	1.20 (0.76,1.91)	1.18 (0.73,1.91)	0.65 (0.33,1.27)	1.85 (1.21,2.84)	0.78 (0.43,1.42)	2.24 (1.83,2.73)	0.99 (0.96,1.02)	1.07 (0.98,1.16)
<200 to death	1.26 (0.92,1.72)	1.17 (0.87,1.57)	0.85 (0.64,1.13)	0.55 (0.36,0.82)	1.69 (1.26,2.27)	0.99 (0.72,1.36)	1.30 (1.15,1.48)	0.99 (0.97,1.01)	1.07 (1.02,1.13)
Off-ART to death	0.98 (0.45,2.12)	1.39 (0.67,2.86)	0.81 (0.41,1.59)	0.92 (0.35,2.40)	1.33 (0.68,2.62)	0.96 (0.40,2.29)	2.05 (1.54,2.74)	0.99 (0.95,1.04)	1.21 (1.07,1.37)

Bold indicates statistically significant adjusted hazard ratios at p<0.05

ART: Antiretroviral treatment; CD4: CD4 T-lymphocyte cell count per μL; dx: Diagnosis; aHR: adjusted hazard ratio; CI: confidence interval.

HET: heterosexual; MSM: men who have sex with men; PWID: people who inject drugs.

* No prior ART utilization at study entry compared to prior ART utilization at study entry.

Supplement Table 2C. Multivariate multi-state Markov model results of disease progression during ART, mortality and ART engagement from the west region study sample (n=5,334)

Reference	HET female	MSM	Black	Hispanic/Latino	PWID	No prior ART*	Age	Time since dx	log(pVL)
	<i>HET male</i>		<i>non-Hispanic white/others</i>		<i>non-PWID</i>	<i>Prior ART</i>	<i>per 10 years</i>	<i>per year</i>	<i>per unit</i>
Transitions	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)
CD4 improvement during ART									
<200 to 200-499	1.27 (0.93,1.74)	1.26 (1.01,1.58)	0.68 (0.53,0.87)	0.94 (0.76,1.16)	1.05 (0.81,1.36)	1.34 (1.07,1.67)	1.12 (1.02,1.24)	0.98 (0.97,0.99)	0.99 (0.95,1.02)
200-499 to ≥500	1.34 (1.07,1.67)	1.10 (0.92,1.31)	0.88 (0.75,1.05)	0.80 (0.69,0.94)	0.99 (0.81,1.19)	1.37 (1.14,1.63)	0.89 (0.83,0.95)	0.99 (0.98,1.00)	0.98 (0.95,1.01)
CD4 deterioration during ART									
≥500 to off-ART	0.85 (0.67,1.07)	0.89 (0.74,1.08)	1.12 (0.93,1.34)	1.03 (0.87,1.21)	1.20 (0.99,1.45)	0.84 (0.68,1.05)	1.09 (1.02,1.17)	1.01 (1.00,1.02)	1.05 (1.01,1.09)
200-499 to <200	0.84 (0.58,1.22)	0.79 (0.60,1.04)	1.21 (0.92,1.60)	1.13 (0.87,1.47)	1.22 (0.92,1.63)	0.94 (0.68,1.31)	1.09 (0.97,1.23)	1.02 (1.00,1.03)	1.14 (1.09,1.20)
ART dropout									
≥500 to off-ART	1.02 (0.77,1.35)	1.17 (0.94,1.47)	0.95 (0.78,1.15)	0.61 (0.50,0.74)	1.24 (1.00,1.53)	1.48 (1.20,1.82)	0.76 (0.71,0.83)	1.00 (0.99,1.02)	0.96 (0.92,1.00)
200-499 to off-ART	1.19 (0.90,1.58)	1.05 (0.84,1.31)	1.12 (0.91,1.38)	0.84 (0.69,1.02)	1.22 (0.97,1.53)	1.14 (0.90,1.45)	0.72 (0.66,0.78)	1.01 (1.00,1.02)	0.96 (0.92,1.00)
<200 to off-ART	0.81 (0.53,1.24)	0.86 (0.64,1.15)	1.08 (0.80,1.45)	0.73 (0.52,1.02)	1.48 (1.08,2.01)	1.03 (0.74,1.43)	0.81 (0.69,0.93)	1.01 (0.99,1.03)	1.04 (0.99,1.10)
ART re-initiation									
Off-ART to ≥500 on-ART	1.69 (1.16,2.45)	1.20 (0.86,1.67)	0.98 (0.75,1.29)	0.90 (0.68,1.17)	0.79 (0.58,1.08)	0.74 (0.54,1.00)	0.95 (0.85,1.06)	0.99 (0.98,1.01)	0.93 (0.88,0.97)
Off-ART to 200-499 on-ART	0.87 (0.59,1.27)	0.95 (0.70,1.27)	1.39 (1.07,1.81)	1.05 (0.78,1.40)	1.14 (0.86,1.51)	0.51 (0.36,0.73)	1.01 (0.89,1.14)	1.00 (0.99,1.02)	1.09 (1.04,1.13)
Off-ART to <200 on-ART	0.66 (0.43,1.02)	0.68 (0.49,0.94)	1.21 (0.87,1.67)	1.65 (1.23,2.23)	1.18 (0.86,1.63)	0.33 (0.21,0.51)	1.04 (0.90,1.19)	1.00 (0.98,1.02)	1.26 (1.20,1.32)
Mortality									
≥500 to death	0.76 (0.20,2.89)	1.04 (0.36,2.96)	1.36 (0.53,3.44)	1.11 (0.41,2.99)	3.52 (1.55,7.99)	2.17 (0.75,6.29)	1.63 (1.09,2.45)	1.01 (0.95,1.06)	0.79 (0.60,1.03)
200-499 to death	1.09 (0.51,2.31)	0.38 (0.20,0.72)	0.20 (0.07,0.58)	0.50 (0.25,1.00)	1.28 (0.69,2.39)	0.54 (0.15,1.93)	1.48 (1.11,1.98)	1.07 (1.03,1.10)	1.00 (0.89,1.14)
<200 to death	0.81 (0.36,1.86)	1.13 (0.65,1.99)	1.46 (0.85,2.50)	1.50 (0.85,2.66)	0.93 (0.50,1.73)	1.08 (0.60,1.96)	2.09 (1.61,2.70)	1.02 (0.99,1.06)	1.19 (1.08,1.30)
Off-ART to death	0.98 (0.18,5.17)	0.23 (0.04,1.45)	0.42 (0.06,2.84)	0.62 (0.07,5.26)	2.57 (0.57,11.71)	0.56 (0.06,5.15)	2.47 (1.15,5.35)	1.02 (0.92,1.12)	1.31 (0.98,1.75)

Bold indicates statistically significant adjusted hazard ratios at p<0.05

ART: Antiretroviral treatment; CD4: CD4 T-lymphocyte cell count per µL; dx: Diagnosis; aHR: adjusted hazard ratio; CI: confidence interval.

HET: heterosexual; MSM: men who have sex with men; PWID: people who inject drugs.

* No prior ART utilization at study entry compared to prior ART utilization at study entry.

RESULTS FROM ADDITIONAL SENSITIVITY ANALYSIS

Results presented here (pages 8-9) are from additional sensitivity analysis with worst- and best-case imputation scenarios in which missing covariates were replaced with values associated with worst and best disease progression outcomes, a statistical approach that has been recommended for its simplicity in assessing potential bias from missing data [1].

Supplement Table 3a. Multivariate multi-state Markov model results of disease progression during ART, mortality and ART engagement from the full eligible sample (N=38,472; best-case imputation scenario[^])

Reference	HET female	MSM	Black	Hispanic/Latino	PWID	No prior ART*	Age	Time since dx	log(pVL)	South	West
	<i>HET male</i>		<i>non-Hispanic white/others</i>		<i>non-PWID</i>	<i>Prior ART</i>	<i>per 10 years</i>	<i>per year</i>	<i>per unit</i>	<i>Northeast</i>	
Transitions	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)
CD4 improvement during ART											
<200 to 200-499	1.36 (1.24,1.49)	1.24 (1.14,1.36)	1.07 (0.98,1.17)	1.06 (0.96,1.18)	0.98 (0.89,1.09)	1.39 (1.27,1.52)	1.02 (0.99,1.06)	0.99 (0.98,1.00)	0.96 (0.95,0.98)	1.18 (1.08,1.27)	1.06 (0.95,1.18)
200-499 to ≥500	1.32 (1.23,1.42)	1.11 (1.04,1.19)	1.00 (0.94,1.06)	0.93 (0.87,0.99)	0.98 (0.91,1.06)	1.31 (1.23,1.40)	0.92 (0.90,0.94)	0.99 (0.99,1.00)	0.97 (0.96,0.99)	0.86 (0.82,0.91)	0.85 (0.79,0.92)
CD4 deterioration during ART											
≥500 to 200-499	0.73 (0.68,0.79)	0.84 (0.78,0.90)	1.13 (1.05,1.21)	1.19 (1.11,1.29)	1.24 (1.14,1.34)	0.88 (0.81,0.96)	1.02 (1.00,1.05)	1.01 (1.00,1.01)	1.08 (1.06,1.09)	1.18 (1.11,1.25)	1.19 (1.10,1.28)
200-499 to <200	1.12 (1.00,1.25)	0.82 (0.73,0.91)	1.13 (1.01,1.26)	1.01 (0.90,1.15)	1.22 (1.09,1.37)	0.85 (0.75,0.96)	1.00 (0.96,1.05)	1.02 (1.02,1.03)	1.17 (1.15,1.20)	0.98 (0.89,1.07)	1.04 (0.91,1.18)
ART dropout											
≥500 to off-ART	1.05 (0.97,1.14)	0.88 (0.81,0.95)	0.97 (0.90,1.04)	0.74 (0.68,0.80)	1.35 (1.24,1.47)	1.11 (1.02,1.21)	0.89 (0.87,0.92)	1.01 (1.00,1.01)	0.98 (0.96,0.99)	2.37 (2.22,2.53)	1.64 (1.50,1.79)
200-499 to off-ART	1.17 (1.08,1.27)	0.88 (0.82,0.96)	1.12 (1.03,1.21)	0.91 (0.83,0.99)	1.45 (1.34,1.58)	0.96 (0.89,1.05)	0.84 (0.81,0.86)	1.00 (1.00,1.01)	1.00 (0.99,1.02)	1.89 (1.76,2.03)	1.37 (1.24,1.51)
<200 to off-ART	1.04 (0.93,1.17)	0.91 (0.81,1.01)	1.24 (1.11,1.40)	0.93 (0.81,1.07)	1.36 (1.21,1.53)	0.75 (0.66,0.85)	0.90 (0.86,0.94)	1.00 (0.99,1.01)	1.01 (0.99,1.03)	1.84 (1.65,2.04)	1.22 (1.05,1.43)
ART re-initiation											
Off-ART to ≥500 on-ART	1.36 (1.25,1.49)	1.29 (1.18,1.41)	0.96 (0.89,1.04)	1.14 (1.04,1.25)	0.86 (0.79,0.94)	1.08 (0.99,1.19)	1.10 (1.07,1.13)	1.00 (0.99,1.00)	0.90 (0.89,0.91)	1.28 (1.20,1.37)	0.50 (0.45,0.56)
Off-ART to 200-499 on-ART	1.01 (0.93,1.10)	1.05 (0.96,1.14)	1.12 (1.03,1.22)	1.34 (1.21,1.47)	1.02 (0.94,1.12)	0.92 (0.83,1.01)	1.05 (1.01,1.08)	1.00 (0.99,1.00)	1.03 (1.01,1.04)	1.39 (1.29,1.50)	0.58 (0.52,0.65)
Off-ART to <200 on-ART	0.81 (0.73,0.89)	0.77 (0.69,0.85)	1.41 (1.27,1.58)	1.54 (1.36,1.75)	0.91 (0.82,1.02)	0.64 (0.57,0.72)	1.00 (0.96,1.04)	1.01 (1.00,1.01)	1.18 (1.16,1.19)	1.72 (1.56,1.89)	0.93 (0.80,1.07)
Mortality											
≥500 to death	0.83 (0.56,1.23)	0.79 (0.53,1.19)	0.79 (0.56,1.13)	0.48 (0.30,0.78)	2.34 (1.65,3.32)	0.70 (0.39,1.24)	1.59 (1.36,1.85)	1.01 (0.99,1.03)	1.06 (0.98,1.15)	1.31 (0.94,1.82)	1.10 (0.71,1.68)
200-499 to death	1.05 (0.79,1.41)	0.69 (0.51,0.93)	0.77 (0.59,1.02)	0.53 (0.38,0.75)	1.60 (1.22,2.09)	0.84 (0.57,1.25)	1.89 (1.67,2.12)	1.01 (1.00,1.03)	1.04 (0.98,1.09)	1.10 (0.85,1.42)	1.21 (0.89,1.65)
<200 to death	1.14 (0.91,1.44)	1.12 (0.90,1.39)	0.88 (0.71,1.09)	0.72 (0.56,0.93)	1.56 (1.26,1.92)	0.93 (0.72,1.19)	1.51 (1.38,1.66)	0.99 (0.98,1.00)	1.07 (1.03,1.11)	1.83 (1.49,2.25)	1.41 (1.07,1.86)
Off-ART to death	1.46 (0.91,2.34)	1.18 (0.70,2.00)	0.71 (0.45,1.11)	0.81 (0.46,1.40)	1.41 (0.91,2.18)	0.79 (0.43,1.45)	1.95 (1.62,2.35)	1.00 (0.97,1.02)	1.15 (1.08,1.24)	1.16 (0.78,1.72)	0.37 (0.18,0.75)

Bold indicates statistically significant adjusted hazard ratios at p<0.05

ART: Antiretroviral treatment; CD4: CD4 T-lymphocyte cell count per μL ; dx: Diagnosis; aHR: adjusted hazard ratio; CI: confidence interval.

HET: heterosexual; MSM: men who have sex with men; PWID: people who inject drugs.

* No prior ART utilization at study entry compared to prior ART utilization at study entry.

[^] Best-case missing covariate imputation scenario: race/ethnicity = non-Hispanic white/others; HIV risk group = HET female or MSM; No prior ART = 1; Time since dx = 0; log(pVL) = sample minimum.

1. Pedersen AB, Mikkelsen EM, Cronin-Fenton D, Kristensen NR, Pham TM, Pedersen L, Petersen I. Missing data and multiple imputation in clinical epidemiological research. *Clinical epidemiology*. 2017;9:157

Supplement Table 3b. Multivariate multi-state Markov model results of disease progression during ART, mortality and ART engagement from the full eligible sample (N=38,472; worst-case imputation scenario[^])

Transitions	HET female		MSM	Black	Hispanic/Latino	PWID	No prior ART*	Age	Time since dx	log(pVL)	South	West
	Reference	HET male		non-Hispanic white/others		non-PWID	Prior ART	per 10 years	per year	per unit	Northeast	
	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)	aHR (95% CI)
CD4 improvement during ART												
<200 to 200-499	1.37 (1.24,1.50)	1.23 (1.13,1.34)	1.06 (0.97,1.17)	1.06 (0.96,1.17)	0.97 (0.88,1.07)	1.39 (1.27,1.52)	1.03 (0.99,1.06)	0.99 (0.99,1.00)	0.98 (0.97,0.99)	1.16 (1.07,1.26)	1.06 (0.96,1.19)	
200-499 to ≥500	1.35 (1.26,1.44)	1.09 (1.03,1.17)	0.99 (0.93,1.05)	0.93 (0.87,0.99)	0.95 (0.88,1.02)	1.27 (1.19,1.35)	0.92 (0.90,0.94)	0.99 (0.99,1.00)	0.99 (0.98,1.00)	0.85 (0.80,0.89)	0.85 (0.79,0.91)	
CD4 deterioration during ART												
≥500 to 200-499	0.72 (0.67,0.78)	0.84 (0.78,0.90)	1.14 (1.06,1.22)	1.19 (1.10,1.28)	1.28 (1.18,1.38)	0.98 (0.90,1.06)	1.02 (1.00,1.05)	1.01 (1.00,1.01)	1.04 (1.03,1.05)	1.25 (1.18,1.33)	1.21 (1.12,1.31)	
200-499 to <200	1.14 (1.02,1.28)	0.82 (0.74,0.92)	1.16 (1.04,1.30)	0.99 (0.88,1.12)	1.25 (1.12,1.40)	0.95 (0.85,1.08)	0.99 (0.95,1.04)	1.02 (1.01,1.02)	1.11 (1.09,1.12)	1.06 (0.97,1.17)	1.09 (0.96,1.23)	
ART dropout												
≥500 to off-ART	1.04 (0.96,1.13)	0.89 (0.83,0.97)	0.98 (0.91,1.05)	0.74 (0.68,0.81)	1.36 (1.25,1.47)	1.03 (0.95,1.12)	0.90 (0.87,0.92)	1.01 (1.00,1.01)	1.01 (1.00,1.02)	2.34 (2.19,2.50)	1.64 (1.50,1.79)	
200-499 to off-ART	1.15 (1.06,1.24)	0.90 (0.83,0.97)	1.12 (1.04,1.22)	0.92 (0.84,1.00)	1.47 (1.36,1.59)	0.93 (0.86,1.01)	0.84 (0.81,0.86)	1.01 (1.00,1.01)	1.02 (1.01,1.03)	1.91 (1.78,2.05)	1.38 (1.25,1.52)	
<200 to off-ART	1.02 (0.91,1.14)	0.92 (0.82,1.02)	1.27 (1.13,1.43)	0.95 (0.83,1.10)	1.40 (1.25,1.57)	0.74 (0.65,0.84)	0.90 (0.86,0.94)	1.00 (0.99,1.01)	1.03 (1.01,1.05)	1.87 (1.68,2.07)	1.24 (1.07,1.45)	
ART re-initiation												
Off-ART to ≥500 on-ART	1.38 (1.26,1.50)	1.29 (1.19,1.41)	0.94 (0.87,1.01)	1.13 (1.03,1.23)	0.85 (0.78,0.92)	0.97 (0.88,1.07)	1.11 (1.08,1.15)	1.00 (0.99,1.00)	0.95 (0.94,0.96)	1.12 (1.04,1.20)	0.50 (0.45,0.56)	
Off-ART to 200-499 on-ART	1.00 (0.92,1.09)	1.05 (0.97,1.14)	1.13 (1.04,1.23)	1.34 (1.21,1.47)	1.04 (0.96,1.13)	0.87 (0.79,0.96)	1.04 (1.01,1.07)	1.00 (0.99,1.00)	1.02 (1.01,1.03)	1.44 (1.34,1.55)	0.58 (0.52,0.65)	
Off-ART to <200 on-ART	0.80 (0.72,0.89)	0.78 (0.70,0.86)	1.43 (1.28,1.60)	1.54 (1.36,1.75)	0.96 (0.86,1.06)	0.76 (0.67,0.86)	0.99 (0.95,1.03)	1.00 (0.99,1.00)	1.09 (1.08,1.10)	2.15 (1.95,2.36)	0.91 (0.79,1.05)	
Mortality												
≥500 to death	0.82 (0.55,1.23)	0.78 (0.52,1.17)	0.82 (0.57,1.18)	0.49 (0.30,0.79)	2.37 (1.69,3.33)	0.80 (0.46,1.37)	1.59 (1.36,1.86)	1.00 (0.98,1.02)	1.00 (0.94,1.07)	1.33 (0.95,1.85)	1.11 (0.72,1.70)	
200-499 to death	1.00 (0.74,1.34)	0.67 (0.50,0.90)	0.83 (0.63,1.10)	0.55 (0.39,0.77)	1.57 (1.21,2.03)	0.97 (0.66,1.42)	1.80 (1.60,2.03)	1.03 (1.01,1.04)	1.01 (0.97,1.05)	1.17 (0.91,1.52)	1.29 (0.95,1.76)	
<200 to death	1.09 (0.86,1.38)	1.16 (0.94,1.43)	0.93 (0.75,1.15)	0.77 (0.59,1.00)	1.62 (1.32,1.97)	1.00 (0.78,1.28)	1.50 (1.36,1.64)	1.00 (0.99,1.02)	1.07 (1.03,1.10)	1.93 (1.57,2.38)	1.41 (1.07,1.85)	
Off-ART to death	1.33 (0.81,2.17)	1.26 (0.76,2.09)	0.74 (0.47,1.17)	0.82 (0.47,1.43)	1.62 (1.07,2.45)	1.04 (0.55,1.98)	1.79 (1.48,2.17)	1.01 (0.98,1.03)	1.00 (0.95,1.05)	1.37 (0.91,2.06)	0.34 (0.16,0.70)	

Bold indicates statistically significant adjusted hazard ratios at p<0.05

ART: Antiretroviral treatment; CD4: CD4 T-lymphocyte cell count per µL; dx: Diagnosis; aHR: adjusted hazard ratio; CI: confidence interval.

HET: heterosexual; MSM: men who have sex with men; PWID: people who inject drugs.

* No prior ART utilization at study entry compared to prior ART utilization at study entry.

[^]Worst-case missing covariate imputation scenario: race/ethnicity = Black; HIV risk group = PWID or MSMPWID ; No prior ART = 0; Time since dx = sample maximum; log(pVL) = sample maximum.

ART dropout rate (CD4 ≥500)

Region	Gender	Ethnicity	Risk	Pt. Estimate	Lower	Upper
South	Male	White	PWID	0.01912	0.01669	0.02187
South	Male	White	MSM	0.01316	0.01215	0.01437
South	Male	White	MWID	0.01889	0.01664	0.02142
South	Male	White	HET	0.01332	0.01188	0.01495
South	Male	Black	PWID	0.01823	0.01621	0.02056
South	Male	Black	MSM	0.01254	0.01156	0.01354
South	Male	Black	MWID	0.01801	0.01589	0.02028
South	Male	Black	HET	0.01269	0.01164	0.01391
South	Male	Hispanic	PWID	0.01088	0.00925	0.01267
South	Male	Hispanic	MSM	0.00746	0.00660	0.00843
South	Male	Hispanic	MWID	0.01073	0.00908	0.01258
South	Male	Hispanic	HET	0.00755	0.00661	0.00869
South	Female	White	PWID	0.01912	0.01653	0.02171
South	Female	White	HET	0.01332	0.01189	0.01505
South	Female	Black	PWID	0.01823	0.01639	0.02033
South	Female	Black	HET	0.01269	0.01164	0.01386
South	Female	Hispanic	PWID	0.01088	0.00939	0.01280
South	Female	Hispanic	HET	0.00755	0.00661	0.00856
Northeast	Male	White	PWID	0.00725	0.00603	0.00885
Northeast	Male	White	MSM	0.00398	0.00357	0.00443
Northeast	Male	White	MWID	0.00442	0.00364	0.00538
Northeast	Male	White	HET	0.00654	0.00547	0.00780
Northeast	Male	Black	PWID	0.00725	0.00611	0.00870
Northeast	Male	Black	MSM	0.00398	0.00354	0.00450
Northeast	Male	Black	MWID	0.00442	0.00367	0.00545
Northeast	Male	Black	HET	0.00654	0.00572	0.00750
Northeast	Male	Hispanic	PWID	0.00744	0.00619	0.00891
Northeast	Male	Hispanic	MSM	0.00408	0.00362	0.00462
Northeast	Male	Hispanic	MWID	0.00453	0.00363	0.00551
Northeast	Male	Hispanic	HET	0.00670	0.00582	0.00774
Northeast	Female	White	PWID	0.00725	0.00602	0.00888
Northeast	Female	White	HET	0.00654	0.00550	0.00780
Northeast	Female	Black	PWID	0.00725	0.00606	0.00870
Northeast	Female	Black	HET	0.00654	0.00572	0.00756
Northeast	Female	Hispanic	PWID	0.00744	0.00620	0.00893
Northeast	Female	Hispanic	HET	0.00670	0.00578	0.00776
West	Male	White	PWID	0.00970	0.00740	0.01266
West	Male	White	MSM	0.00920	0.00834	0.01016
West	Male	White	MWID	0.01138	0.00940	0.01401
West	Male	White	HET	0.00784	0.00628	0.00975
West	Male	Black	PWID	0.00919	0.00698	0.01235
West	Male	Black	MSM	0.00871	0.00724	0.01047
West	Male	Black	MWID	0.01078	0.00825	0.01412
West	Male	Black	HET	0.00743	0.00578	0.00953
West	Male	Hispanic	PWID	0.00595	0.00440	0.00795
West	Male	Hispanic	MSM	0.00564	0.00472	0.00674
West	Male	Hispanic	MWID	0.00698	0.00536	0.00898
West	Male	Hispanic	HET	0.00481	0.00370	0.00615
West	Female	White	PWID	0.00970	0.00754	0.01241
West	Female	White	HET	0.00784	0.00625	0.00989
West	Female	Black	PWID	0.00919	0.00693	0.01218
West	Female	Black	HET	0.00743	0.00573	0.00966
West	Female	Hispanic	PWID	0.00595	0.00442	0.00802
West	Female	Hispanic	HET	0.00481	0.00372	0.00621

ART dropout rate (CD4 200-499)

Region	Gender	Ethnicity	Risk	Pt. Estimate	Lower	Upper
South	Male	White	PWID	0.02620	0.02291	0.02978
South	Male	White	MSM	0.01406	0.01290	0.01538
South	Male	White	MWID	0.02353	0.02058	0.02698
South	Male	White	HET	0.01567	0.01402	0.01763
South	Male	Black	PWID	0.02961	0.02665	0.03293
South	Male	Black	MSM	0.01590	0.01471	0.01726
South	Male	Black	MWID	0.02659	0.02347	0.02975
South	Male	Black	HET	0.01771	0.01640	0.01920
South	Male	Hispanic	PWID	0.02080	0.01817	0.02377
South	Male	Hispanic	MSM	0.01114	0.01000	0.01238
South	Male	Hispanic	MWID	0.01867	0.01612	0.02171
South	Male	Hispanic	HET	0.01242	0.01107	0.01393
South	Female	White	PWID	0.02620	0.02277	0.03000
South	Female	White	HET	0.01567	0.01399	0.01755
South	Female	Black	PWID	0.02961	0.02682	0.03264
South	Female	Black	HET	0.01771	0.01645	0.01927
South	Female	Hispanic	PWID	0.02080	0.01824	0.02398
South	Female	Hispanic	HET	0.01242	0.01102	0.01397
Northeast	Male	White	PWID	0.00925	0.00741	0.01151
Northeast	Male	White	MSM	0.00661	0.00588	0.00753
Northeast	Male	White	MWID	0.00703	0.00571	0.00869
Northeast	Male	White	HET	0.00871	0.00734	0.01060
Northeast	Male	Black	PWID	0.00939	0.00790	0.01122
Northeast	Male	Black	MSM	0.00671	0.00581	0.00758
Northeast	Male	Black	MWID	0.00713	0.00573	0.00880
Northeast	Male	Black	HET	0.00884	0.00768	0.01013
Northeast	Male	Hispanic	PWID	0.01032	0.00864	0.01225
Northeast	Male	Hispanic	MSM	0.00737	0.00641	0.00836
Northeast	Male	Hispanic	MWID	0.00784	0.00637	0.00973
Northeast	Male	Hispanic	HET	0.00971	0.00843	0.01117
Northeast	Female	White	PWID	0.00925	0.00752	0.01142
Northeast	Female	White	HET	0.00871	0.00731	0.01056
Northeast	Female	Black	PWID	0.00939	0.00791	0.01124
Northeast	Female	Black	HET	0.00884	0.00768	0.01019
Northeast	Female	Hispanic	PWID	0.01032	0.00875	0.01238
Northeast	Female	Hispanic	HET	0.00971	0.00846	0.01118
West	Male	White	PWID	0.01277	0.01007	0.01624
West	Male	White	MSM	0.01099	0.00967	0.01224
West	Male	White	MWID	0.01340	0.01076	0.01675
West	Male	White	HET	0.01047	0.00832	0.01300
West	Male	Black	PWID	0.01430	0.01081	0.01897
West	Male	Black	MSM	0.01230	0.01018	0.01499
West	Male	Black	MWID	0.01500	0.01141	0.01961
West	Male	Black	HET	0.01173	0.00941	0.01497
West	Male	Hispanic	PWID	0.01067	0.00802	0.01403
West	Male	Hispanic	MSM	0.00918	0.00786	0.01082
West	Male	Hispanic	MWID	0.01120	0.00855	0.01427
West	Male	Hispanic	HET	0.00875	0.00695	0.01115
West	Female	White	PWID	0.01277	0.00984	0.01650
West	Female	White	HET	0.01047	0.00854	0.01284
West	Female	Black	PWID	0.01430	0.01112	0.01864
West	Female	Black	HET	0.01173	0.00936	0.01478
West	Female	Hispanic	PWID	0.01067	0.00796	0.01424
West	Female	Hispanic	HET	0.00875	0.00700	0.01100

ART dropout rate (CD4 <200)

Region	Gender	Ethnicity	Risk	Pt. Estimate	Lower	Upper
South	Male	White	PWID	0.03141	0.02577	0.03803
South	Male	White	MSM	0.01883	0.01615	0.02210
South	Male	White	MWID	0.02813	0.02319	0.03414
South	Male	White	HET	0.02104	0.01760	0.02498
South	Male	Black	PWID	0.04053	0.03492	0.04730
South	Male	Black	MSM	0.02434	0.02148	0.02766
South	Male	Black	MWID	0.03633	0.03018	0.04393
South	Male	Black	HET	0.02718	0.02412	0.03059
South	Male	Hispanic	PWID	0.02403	0.01915	0.02931
South	Male	Hispanic	MSM	0.01437	0.01200	0.01709
South	Male	Hispanic	MWID	0.02153	0.01693	0.02702
South	Male	Hispanic	HET	0.01605	0.01333	0.01920
South	Female	White	PWID	0.03141	0.02598	0.03825
South	Female	White	HET	0.02104	0.01763	0.02504
South	Female	Black	PWID	0.04053	0.03514	0.04736
South	Female	Black	HET	0.02718	0.02425	0.03044
South	Female	Hispanic	PWID	0.02403	0.01951	0.02933
South	Female	Hispanic	HET	0.01605	0.01328	0.01929
Northeast	Male	White	PWID	0.01292	0.00983	0.01747
Northeast	Male	White	MSM	0.01126	0.00884	0.01445
Northeast	Male	White	MWID	0.01374	0.01008	0.01903
Northeast	Male	White	HET	0.01059	0.00798	0.01421
Northeast	Male	Black	PWID	0.01561	0.01225	0.01962
Northeast	Male	Black	MSM	0.01358	0.01104	0.01643
Northeast	Male	Black	MWID	0.01659	0.01259	0.02188
Northeast	Male	Black	HET	0.01278	0.01043	0.01591
Northeast	Male	Hispanic	PWID	0.01701	0.01333	0.02178
Northeast	Male	Hispanic	MSM	0.01478	0.01174	0.01837
Northeast	Male	Hispanic	MWID	0.01806	0.01333	0.02416
Northeast	Male	Hispanic	HET	0.01392	0.01127	0.01686
Northeast	Female	White	PWID	0.01292	0.00961	0.01723
Northeast	Female	White	HET	0.01059	0.00809	0.01372
Northeast	Female	Black	PWID	0.01561	0.01248	0.01977
Northeast	Female	Black	HET	0.01278	0.01057	0.01540
Northeast	Female	Hispanic	PWID	0.01701	0.01308	0.02210
Northeast	Female	Hispanic	HET	0.01392	0.01144	0.01710
West	Male	White	PWID	0.02406	0.01704	0.03332
West	Male	White	MSM	0.01412	0.01126	0.01769
West	Male	White	MWID	0.02075	0.01511	0.02876
West	Male	White	HET	0.01638	0.01212	0.02244
West	Male	Black	PWID	0.02595	0.01829	0.03651
West	Male	Black	MSM	0.01523	0.01160	0.02014
West	Male	Black	MWID	0.02239	0.01562	0.03198
West	Male	Black	HET	0.01766	0.01308	0.02394
West	Male	Hispanic	PWID	0.01760	0.01155	0.02598
West	Male	Hispanic	MSM	0.01033	0.00777	0.01381
West	Male	Hispanic	MWID	0.01519	0.01007	0.02278
West	Male	Hispanic	HET	0.01197	0.00840	0.01666
West	Female	White	PWID	0.02406	0.01691	0.03385
West	Female	White	HET	0.01638	0.01239	0.02234
West	Female	Black	PWID	0.02595	0.01820	0.03742
West	Female	Black	HET	0.01766	0.01326	0.02423
West	Female	Hispanic	PWID	0.01760	0.01191	0.02636
West	Female	Hispanic	HET	0.01197	0.00855	0.01701

ART re-initiation rate (no CD4 stratification)

Region	Gender	Ethnicity	Risk	Pt. Estimate	Lower	Upper
South	Male	White	PWID	0.04029	0.04453	0.03626
South	Male	White	MSM	0.04532	0.04845	0.04242
South	Male	White	MWID	0.04398	0.04851	0.03958
South	Male	White	HET	0.04120	0.04486	0.03752
South	Male	Black	PWID	0.04616	0.05006	0.04276
South	Male	Black	MSM	0.05074	0.05384	0.04775
South	Male	Black	MWID	0.04946	0.05391	0.04475
South	Male	Black	HET	0.04705	0.05016	0.04427
South	Male	Hispanic	PWID	0.05224	0.05771	0.04669
South	Male	Hispanic	MSM	0.05667	0.06146	0.05214
South	Male	Hispanic	MWID	0.05553	0.06220	0.04908
South	Male	Hispanic	HET	0.05299	0.05754	0.04855
South	Female	White	PWID	0.04029	0.04475	0.03631
South	Female	White	HET	0.04120	0.04473	0.03738
South	Female	Black	PWID	0.04616	0.04980	0.04265
South	Female	Black	HET	0.04705	0.04977	0.04425
South	Female	Hispanic	PWID	0.05224	0.05779	0.04696
South	Female	Hispanic	HET	0.05299	0.05742	0.04868
Northeast	Male	White	PWID	0.02333	0.02728	0.01962
Northeast	Male	White	MSM	0.02860	0.03133	0.02584
Northeast	Male	White	MWID	0.02480	0.02870	0.02091
Northeast	Male	White	HET	0.02694	0.03087	0.02321
Northeast	Male	Black	PWID	0.02820	0.03180	0.02504
Northeast	Male	Black	MSM	0.03408	0.03711	0.03114
Northeast	Male	Black	MWID	0.02947	0.03395	0.02533
Northeast	Male	Black	HET	0.03269	0.03572	0.02973
Northeast	Male	Hispanic	PWID	0.03533	0.03994	0.03112
Northeast	Male	Hispanic	MSM	0.04318	0.04718	0.03948
Northeast	Male	Hispanic	MWID	0.03747	0.04336	0.03222
Northeast	Male	Hispanic	HET	0.04076	0.04498	0.03707
Northeast	Female	White	PWID	0.02333	0.02743	0.01963
Northeast	Female	White	HET	0.02694	0.03091	0.02322
Northeast	Female	Black	PWID	0.02820	0.03176	0.02479
Northeast	Female	Black	HET	0.03269	0.03573	0.02987
Northeast	Female	Hispanic	PWID	0.03533	0.03995	0.03132
Northeast	Female	Hispanic	HET	0.04076	0.04505	0.03731
West	Male	White	PWID	0.01865	0.02419	0.01305
West	Male	White	MSM	0.01766	0.01955	0.01589
West	Male	White	MWID	0.01746	0.02106	0.01410
West	Male	White	HET	0.01825	0.02257	0.01454
West	Male	Black	PWID	0.02276	0.02918	0.01728
West	Male	Black	MSM	0.02073	0.02413	0.01795
West	Male	Black	MWID	0.02102	0.02651	0.01643
West	Male	Black	HET	0.02180	0.02618	0.01778
West	Male	Hispanic	PWID	0.02225	0.03009	0.01473
West	Male	Hispanic	MSM	0.01935	0.02266	0.01672
West	Male	Hispanic	MWID	0.01976	0.02453	0.01516
West	Male	Hispanic	HET	0.02109	0.02681	0.01556
West	Female	White	PWID	0.01865	0.02400	0.01263
West	Female	White	HET	0.01825	0.02275	0.01419
West	Female	Black	PWID	0.02276	0.02897	0.01710
West	Female	Black	HET	0.02180	0.02620	0.01797
West	Female	Hispanic	PWID	0.02225	0.02977	0.01433
West	Female	Hispanic	HET	0.02109	0.02656	0.01606

Disease progression on ART (CD4 ≥500 to CD4 200-499)

Region	Gender	Ethnicity	Risk	Pt. Estimate	Lower	Upper
South	Male	White	PWID	0.01569	0.01348	0.01832
South	Male	White	MSM	0.01105	0.01009	0.01215
South	Male	White	MWID	0.01335	0.01156	0.01533
South	Male	White	HET	0.01300	0.01155	0.01478
South	Male	Black	PWID	0.01589	0.01389	0.01802
South	Male	Black	MSM	0.01120	0.01029	0.01222
South	Male	Black	MWID	0.01353	0.01166	0.01546
South	Male	Black	HET	0.01317	0.01201	0.01450
South	Male	Hispanic	PWID	0.01822	0.01563	0.02151
South	Male	Hispanic	MSM	0.01280	0.01159	0.01426
South	Male	Hispanic	MWID	0.01549	0.01324	0.01841
South	Male	Hispanic	HET	0.01507	0.01345	0.01696
South	Female	White	PWID	0.01569	0.01340	0.01853
South	Female	White	HET	0.01300	0.01152	0.01495
South	Female	Black	PWID	0.01589	0.01393	0.01807
South	Female	Black	HET	0.01317	0.01200	0.01443
South	Female	Hispanic	PWID	0.01822	0.01562	0.02131
South	Female	Hispanic	HET	0.01507	0.01336	0.01705
Northeast	Male	White	PWID	0.01141	0.00983	0.01325
Northeast	Male	White	MSM	0.00772	0.00715	0.00836
Northeast	Male	White	MWID	0.00968	0.00851	0.01105
Northeast	Male	White	HET	0.00911	0.00810	0.01037
Northeast	Male	Black	PWID	0.01438	0.01265	0.01625
Northeast	Male	Black	MSM	0.00974	0.00896	0.01053
Northeast	Male	Black	MWID	0.01220	0.01051	0.01415
Northeast	Male	Black	HET	0.01149	0.01034	0.01273
Northeast	Male	Hispanic	PWID	0.01423	0.01244	0.01632
Northeast	Male	Hispanic	MSM	0.00964	0.00876	0.01048
Northeast	Male	Hispanic	MWID	0.01207	0.01049	0.01402
Northeast	Male	Hispanic	HET	0.01137	0.01020	0.01270
Northeast	Female	White	PWID	0.01141	0.00998	0.01328
Northeast	Female	White	HET	0.00911	0.00800	0.01039
Northeast	Female	Black	PWID	0.01438	0.01283	0.01620
Northeast	Female	Black	HET	0.01149	0.01048	0.01267
Northeast	Female	Hispanic	PWID	0.01423	0.01261	0.01619
Northeast	Female	Hispanic	HET	0.01137	0.01018	0.01255
West	Male	White	PWID	0.01314	0.01046	0.01658
West	Male	White	MSM	0.00984	0.00890	0.01083
West	Male	White	MWID	0.01175	0.00968	0.01420
West	Male	White	HET	0.01102	0.00910	0.01330
West	Male	Black	PWID	0.01467	0.01137	0.01831
West	Male	Black	MSM	0.01099	0.00931	0.01295
West	Male	Black	MWID	0.01311	0.01035	0.01644
West	Male	Black	HET	0.01230	0.01002	0.01534
West	Male	Hispanic	PWID	0.01352	0.01048	0.01708
West	Male	Hispanic	MSM	0.01012	0.00875	0.01172
West	Male	Hispanic	MWID	0.01208	0.00951	0.01497
West	Male	Hispanic	HET	0.01133	0.00925	0.01403
West	Female	White	PWID	0.01314	0.01037	0.01614
West	Female	White	HET	0.01102	0.00909	0.01330
West	Female	Black	PWID	0.01467	0.01150	0.01870
West	Female	Black	HET	0.01230	0.01007	0.01515
West	Female	Hispanic	PWID	0.01352	0.01048	0.01697
West	Female	Hispanic	HET	0.01133	0.00927	0.01376

Disease progression on ART (CD4 ≥500 to CD4 <200)

Region	Gender	Ethnicity	Risk	Pt. Estimate	Lower	Upper
South	Male	White	PWID	0.00016	0.00014	0.00019
South	Male	White	MSM	0.00009	0.00008	0.00010
South	Male	White	MWID	0.00013	0.00011	0.00015
South	Male	White	HET	0.00012	0.00010	0.00013
South	Male	Black	PWID	0.00019	0.00016	0.00021
South	Male	Black	MSM	0.00011	0.00010	0.00012
South	Male	Black	MWID	0.00015	0.00013	0.00017
South	Male	Black	HET	0.00013	0.00012	0.00015
South	Male	Hispanic	PWID	0.00015	0.00013	0.00018
South	Male	Hispanic	MSM	0.00008	0.00007	0.00010
South	Male	Hispanic	MWID	0.00012	0.00010	0.00014
South	Male	Hispanic	HET	0.00011	0.00009	0.00012
South	Female	White	PWID	0.00016	0.00014	0.00020
South	Female	White	HET	0.00012	0.00010	0.00013
South	Female	Black	PWID	0.00019	0.00016	0.00022
South	Female	Black	HET	0.00013	0.00012	0.00015
South	Female	Hispanic	PWID	0.00015	0.00013	0.00018
South	Female	Hispanic	HET	0.00011	0.00009	0.00012
Northeast	Male	White	PWID	0.00005	0.00004	0.00007
Northeast	Male	White	MSM	0.00002	0.00002	0.00003
Northeast	Male	White	MWID	0.00003	0.00003	0.00004
Northeast	Male	White	HET	0.00004	0.00003	0.00005
Northeast	Male	Black	PWID	0.00008	0.00007	0.00010
Northeast	Male	Black	MSM	0.00004	0.00003	0.00004
Northeast	Male	Black	MWID	0.00005	0.00004	0.00006
Northeast	Male	Black	HET	0.00006	0.00006	0.00007
Northeast	Male	Hispanic	PWID	0.00008	0.00006	0.00009
Northeast	Male	Hispanic	MSM	0.00003	0.00003	0.00004
Northeast	Male	Hispanic	MWID	0.00005	0.00004	0.00006
Northeast	Male	Hispanic	HET	0.00006	0.00005	0.00007
Northeast	Female	White	PWID	0.00005	0.00004	0.00007
Northeast	Female	White	HET	0.00004	0.00003	0.00005
Northeast	Female	Black	PWID	0.00008	0.00007	0.00010
Northeast	Female	Black	HET	0.00006	0.00006	0.00007
Northeast	Female	Hispanic	PWID	0.00008	0.00006	0.00009
Northeast	Female	Hispanic	HET	0.00006	0.00005	0.00007
West	Male	White	PWID	0.00008	0.00006	0.00011
West	Male	White	MSM	0.00004	0.00003	0.00005
West	Male	White	MWID	0.00006	0.00005	0.00008
West	Male	White	HET	0.00006	0.00004	0.00007
West	Male	Black	PWID	0.00010	0.00008	0.00014
West	Male	Black	MSM	0.00005	0.00004	0.00007
West	Male	Black	MWID	0.00008	0.00005	0.00011
West	Male	Black	HET	0.00007	0.00006	0.00009
West	Male	Hispanic	PWID	0.00009	0.00007	0.00013
West	Male	Hispanic	MSM	0.00005	0.00004	0.00006
West	Male	Hispanic	MWID	0.00007	0.00005	0.00009
West	Male	Hispanic	HET	0.00006	0.00005	0.00008
West	Female	White	PWID	0.00008	0.00006	0.00011
West	Female	White	HET	0.00006	0.00004	0.00007
West	Female	Black	PWID	0.00010	0.00008	0.00014
West	Female	Black	HET	0.00007	0.00005	0.00009
West	Female	Hispanic	PWID	0.00009	0.00007	0.00013
West	Female	Hispanic	HET	0.00006	0.00005	0.00008

Disease progression on ART (CD4 200-499 to CD4 <200)

Region	Gender	Ethnicity	Risk	Pt. Estimate	Lower	Upper
South	Male	White	PWID	0.00814	0.00653	0.01000
South	Male	White	MSM	0.00590	0.00509	0.00679
South	Male	White	MWID	0.00703	0.00568	0.00887
South	Male	White	HET	0.00684	0.00568	0.00814
South	Male	Black	PWID	0.00781	0.00653	0.00932
South	Male	Black	MSM	0.00565	0.00492	0.00643
South	Male	Black	MWID	0.00673	0.00554	0.00834
South	Male	Black	HET	0.00656	0.00570	0.00743
South	Male	Hispanic	PWID	0.00702	0.00570	0.00885
South	Male	Hispanic	MSM	0.00506	0.00426	0.00599
South	Male	Hispanic	MWID	0.00606	0.00476	0.00773
South	Male	Hispanic	HET	0.00587	0.00495	0.00705
South	Female	White	PWID	0.00814	0.00655	0.01028
South	Female	White	HET	0.00684	0.00559	0.00824
South	Female	Black	PWID	0.00781	0.00654	0.00942
South	Female	Black	HET	0.00656	0.00577	0.00751
South	Female	Hispanic	PWID	0.00702	0.00567	0.00906
South	Female	Hispanic	HET	0.00587	0.00496	0.00706
Northeast	Male	White	PWID	0.00693	0.00554	0.00869
Northeast	Male	White	MSM	0.00429	0.00366	0.00501
Northeast	Male	White	MWID	0.00544	0.00435	0.00677
Northeast	Male	White	HET	0.00546	0.00438	0.00677
Northeast	Male	Black	PWID	0.00830	0.00682	0.01002
Northeast	Male	Black	MSM	0.00514	0.00440	0.00593
Northeast	Male	Black	MWID	0.00652	0.00523	0.00805
Northeast	Male	Black	HET	0.00654	0.00559	0.00770
Northeast	Male	Hispanic	PWID	0.00745	0.00617	0.00901
Northeast	Male	Hispanic	MSM	0.00461	0.00394	0.00542
Northeast	Male	Hispanic	MWID	0.00585	0.00461	0.00722
Northeast	Male	Hispanic	HET	0.00587	0.00494	0.00693
Northeast	Female	White	PWID	0.00693	0.00552	0.00883
Northeast	Female	White	HET	0.00546	0.00429	0.00682
Northeast	Female	Black	PWID	0.00830	0.00695	0.00985
Northeast	Female	Black	HET	0.00654	0.00568	0.00763
Northeast	Female	Hispanic	PWID	0.00745	0.00617	0.00906
Northeast	Female	Hispanic	HET	0.00587	0.00497	0.00703
West	Male	White	PWID	0.00775	0.00563	0.01072
West	Male	White	MSM	0.00499	0.00418	0.00594
West	Male	White	MWID	0.00607	0.00455	0.00815
West	Male	White	HET	0.00638	0.00478	0.00848
West	Male	Black	PWID	0.00943	0.00668	0.01314
West	Male	Black	MSM	0.00608	0.00478	0.00786
West	Male	Black	MWID	0.00739	0.00507	0.01060
West	Male	Black	HET	0.00776	0.00587	0.01024
West	Male	Hispanic	PWID	0.00884	0.00623	0.01242
West	Male	Hispanic	MSM	0.00569	0.00455	0.00707
West	Male	Hispanic	MWID	0.00693	0.00480	0.00988
West	Male	Hispanic	HET	0.00727	0.00541	0.00962
West	Female	White	PWID	0.00775	0.00560	0.01075
West	Female	White	HET	0.00638	0.00473	0.00858
West	Female	Black	PWID	0.00943	0.00676	0.01313
West	Female	Black	HET	0.00776	0.00578	0.01039
West	Female	Hispanic	PWID	0.00884	0.00619	0.01242
West	Female	Hispanic	HET	0.00727	0.00546	0.00947

Disease progression on ART (CD4 200-499 to CD4 ≥500)

Region	Gender	Ethnicity	Risk	Pt. Estimate	Lower	Upper
South	Male	White	PWID	0.01427	0.01225	0.01677
South	Male	White	MSM	0.01709	0.01577	0.01854
South	Male	White	MWID	0.01553	0.01345	0.01788
South	Male	White	HET	0.01573	0.01404	0.01759
South	Male	Black	PWID	0.01480	0.01305	0.01687
South	Male	Black	MSM	0.01773	0.01638	0.01914
South	Male	Black	MWID	0.01611	0.01398	0.01867
South	Male	Black	HET	0.01632	0.01506	0.01768
South	Male	Hispanic	PWID	0.01271	0.01101	0.01487
South	Male	Hispanic	MSM	0.01519	0.01390	0.01668
South	Male	Hispanic	MWID	0.01382	0.01180	0.01621
South	Male	Hispanic	HET	0.01398	0.01256	0.01557
South	Female	White	PWID	0.01427	0.01208	0.01660
South	Female	White	HET	0.01573	0.01407	0.01768
South	Female	Black	PWID	0.01480	0.01307	0.01692
South	Female	Black	HET	0.01632	0.01495	0.01773
South	Female	Hispanic	PWID	0.01271	0.01100	0.01472
South	Female	Hispanic	HET	0.01398	0.01257	0.01554
Northeast	Male	White	PWID	0.01688	0.01472	0.01924
Northeast	Male	White	MSM	0.01974	0.01845	0.02121
Northeast	Male	White	MWID	0.01910	0.01692	0.02163
Northeast	Male	White	HET	0.01746	0.01557	0.01961
Northeast	Male	Black	PWID	0.01691	0.01491	0.01897
Northeast	Male	Black	MSM	0.01978	0.01838	0.02138
Northeast	Male	Black	MWID	0.01914	0.01657	0.02185
Northeast	Male	Black	HET	0.01750	0.01596	0.01914
Northeast	Male	Hispanic	PWID	0.01771	0.01569	0.01990
Northeast	Male	Hispanic	MSM	0.02071	0.01917	0.02241
Northeast	Male	Hispanic	MWID	0.02003	0.01755	0.02323
Northeast	Male	Hispanic	HET	0.01832	0.01669	0.02019
Northeast	Female	White	PWID	0.01688	0.01477	0.01942
Northeast	Female	White	HET	0.01746	0.01546	0.01965
Northeast	Female	Black	PWID	0.01691	0.01498	0.01882
Northeast	Female	Black	HET	0.01750	0.01595	0.01920
Northeast	Female	Hispanic	PWID	0.01771	0.01574	0.01992
Northeast	Female	Hispanic	HET	0.01832	0.01650	0.02028
West	Male	White	PWID	0.01617	0.01311	0.01989
West	Male	White	MSM	0.01807	0.01662	0.01983
West	Male	White	MWID	0.01774	0.01481	0.02166
West	Male	White	HET	0.01648	0.01371	0.01967
West	Male	Black	PWID	0.01430	0.01121	0.01815
West	Male	Black	MSM	0.01599	0.01373	0.01859
West	Male	Black	MWID	0.01568	0.01240	0.01973
West	Male	Black	HET	0.01458	0.01207	0.01774
West	Male	Hispanic	PWID	0.01307	0.01043	0.01636
West	Male	Hispanic	MSM	0.01461	0.01278	0.01665
West	Male	Hispanic	MWID	0.01434	0.01154	0.01769
West	Male	Hispanic	HET	0.01332	0.01100	0.01592
West	Female	White	PWID	0.01617	0.01326	0.02011
West	Female	White	HET	0.01648	0.01363	0.01952
West	Female	Black	PWID	0.01430	0.01135	0.01802
West	Female	Black	HET	0.01458	0.01213	0.01771
West	Female	Hispanic	PWID	0.01307	0.01033	0.01672
West	Female	Hispanic	HET	0.01332	0.01114	0.01602

Disease progression on ART (CD4 <200 to CD4 ≥500)

Region	Gender	Ethnicity	Risk	Pt. Estimate	Lower	Upper
South	Male	White	PWID	0.00040	0.00034	0.00047
South	Male	White	MSM	0.00045	0.00040	0.00050
South	Male	White	MWID	0.00049	0.00042	0.00059
South	Male	White	HET	0.00037	0.00032	0.00042
South	Male	Black	PWID	0.00052	0.00045	0.00060
South	Male	Black	MSM	0.00058	0.00053	0.00064
South	Male	Black	MWID	0.00063	0.00054	0.00075
South	Male	Black	HET	0.00047	0.00043	0.00052
South	Male	Hispanic	PWID	0.00037	0.00031	0.00044
South	Male	Hispanic	MSM	0.00042	0.00037	0.00048
South	Male	Hispanic	MWID	0.00045	0.00038	0.00055
South	Male	Hispanic	HET	0.00034	0.00030	0.00040
South	Female	White	PWID	0.00040	0.00034	0.00048
South	Female	White	HET	0.00037	0.00032	0.00042
South	Female	Black	PWID	0.00052	0.00045	0.00060
South	Female	Black	HET	0.00047	0.00043	0.00052
South	Female	Hispanic	PWID	0.00037	0.00031	0.00044
South	Female	Hispanic	HET	0.00034	0.00030	0.00040
Northeast	Male	White	PWID	0.00025	0.00020	0.00031
Northeast	Male	White	MSM	0.00041	0.00036	0.00048
Northeast	Male	White	MWID	0.00039	0.00031	0.00047
Northeast	Male	White	HET	0.00027	0.00022	0.00033
Northeast	Male	Black	PWID	0.00029	0.00025	0.00035
Northeast	Male	Black	MSM	0.00048	0.00042	0.00054
Northeast	Male	Black	MWID	0.00045	0.00037	0.00056
Northeast	Male	Black	HET	0.00031	0.00027	0.00036
Northeast	Male	Hispanic	PWID	0.00035	0.00029	0.00042
Northeast	Male	Hispanic	MSM	0.00055	0.00048	0.00064
Northeast	Male	Hispanic	MWID	0.00052	0.00043	0.00066
Northeast	Male	Hispanic	HET	0.00036	0.00032	0.00042
Northeast	Female	White	PWID	0.00025	0.00021	0.00031
Northeast	Female	White	HET	0.00027	0.00022	0.00033
Northeast	Female	Black	PWID	0.00029	0.00025	0.00035
Northeast	Female	Black	HET	0.00031	0.00027	0.00036
Northeast	Female	Hispanic	PWID	0.00035	0.00029	0.00042
Northeast	Female	Hispanic	HET	0.00036	0.00032	0.00042
West	Male	White	PWID	0.00031	0.00022	0.00042
West	Male	White	MSM	0.00038	0.00033	0.00045
West	Male	White	MWID	0.00040	0.00031	0.00054
West	Male	White	HET	0.00029	0.00023	0.00038
West	Male	Black	PWID	0.00021	0.00016	0.00030
West	Male	Black	MSM	0.00026	0.00020	0.00032
West	Male	Black	MWID	0.00027	0.00020	0.00038
West	Male	Black	HET	0.00020	0.00015	0.00026
West	Male	Hispanic	PWID	0.00023	0.00016	0.00031
West	Male	Hispanic	MSM	0.00028	0.00024	0.00035
West	Male	Hispanic	MWID	0.00030	0.00022	0.00040
West	Male	Hispanic	HET	0.00022	0.00017	0.00029
West	Female	White	PWID	0.00031	0.00023	0.00043
West	Female	White	HET	0.00029	0.00023	0.00037
West	Female	Black	PWID	0.00021	0.00016	0.00029
West	Female	Black	HET	0.00020	0.00016	0.00027
West	Female	Hispanic	PWID	0.00023	0.00016	0.00032
West	Female	Hispanic	HET	0.00022	0.00017	0.00028

Disease progression on ART (CD4 <200 to CD4 200-499)

Region	Gender	Ethnicity	Risk	Pt. Estimate	Lower	Upper
South	Male	White	PWID	0.02636	0.02176	0.03164
South	Male	White	MSM	0.02975	0.02642	0.03381
South	Male	White	MWID	0.03018	0.02513	0.03599
South	Male	White	HET	0.02599	0.02229	0.03036
South	Male	Black	PWID	0.03287	0.02837	0.03819
South	Male	Black	MSM	0.03714	0.03324	0.04159
South	Male	Black	MWID	0.03762	0.03154	0.04550
South	Male	Black	HET	0.03245	0.02915	0.03606
South	Male	Hispanic	PWID	0.03129	0.02587	0.03736
South	Male	Hispanic	MSM	0.03520	0.03088	0.03970
South	Male	Hispanic	MWID	0.03580	0.02929	0.04363
South	Male	Hispanic	HET	0.03076	0.02673	0.03513
South	Female	White	PWID	0.02636	0.02195	0.03155
South	Female	White	HET	0.02599	0.02229	0.03055
South	Female	Black	PWID	0.03287	0.02789	0.03847
South	Female	Black	HET	0.03245	0.02928	0.03600
South	Female	Hispanic	PWID	0.03129	0.02600	0.03735
South	Female	Hispanic	HET	0.03076	0.02696	0.03508
Northeast	Male	White	PWID	0.02144	0.01694	0.02656
Northeast	Male	White	MSM	0.03281	0.02822	0.03767
Northeast	Male	White	MWID	0.03084	0.02495	0.03840
Northeast	Male	White	HET	0.02281	0.01901	0.02817
Northeast	Male	Black	PWID	0.02372	0.01967	0.02874
Northeast	Male	Black	MSM	0.03626	0.03204	0.04117
Northeast	Male	Black	MWID	0.03410	0.02749	0.04235
Northeast	Male	Black	HET	0.02522	0.02190	0.02936
Northeast	Male	Hispanic	PWID	0.02413	0.01984	0.02924
Northeast	Male	Hispanic	MSM	0.03685	0.03178	0.04290
Northeast	Male	Hispanic	MWID	0.03467	0.02786	0.04334
Northeast	Male	Hispanic	HET	0.02565	0.02209	0.03013
Northeast	Female	White	PWID	0.02144	0.01730	0.02656
Northeast	Female	White	HET	0.02281	0.01877	0.02799
Northeast	Female	Black	PWID	0.02372	0.01961	0.02868
Northeast	Female	Black	HET	0.02522	0.02180	0.02875
Northeast	Female	Hispanic	PWID	0.02413	0.01981	0.02962
Northeast	Female	Hispanic	HET	0.02565	0.02184	0.03009
West	Male	White	PWID	0.02916	0.02151	0.03903
West	Male	White	MSM	0.03502	0.03035	0.04063
West	Male	White	MWID	0.03662	0.02834	0.04727
West	Male	White	HET	0.02789	0.02207	0.03474
West	Male	Black	PWID	0.01999	0.01417	0.02763
West	Male	Black	MSM	0.02398	0.01889	0.03014
West	Male	Black	MWID	0.02509	0.01852	0.03463
West	Male	Black	HET	0.01910	0.01432	0.02455
West	Male	Hispanic	PWID	0.02751	0.01968	0.03676
West	Male	Hispanic	MSM	0.03299	0.02785	0.03895
West	Male	Hispanic	MWID	0.03453	0.02598	0.04566
West	Male	Hispanic	HET	0.02628	0.02054	0.03360
West	Female	White	PWID	0.02916	0.02178	0.03923
West	Female	White	HET	0.02789	0.02242	0.03550
West	Female	Black	PWID	0.01999	0.01428	0.02692
West	Female	Black	HET	0.01910	0.01468	0.02508
West	Female	Hispanic	PWID	0.02751	0.01954	0.03792
West	Female	Hispanic	HET	0.02628	0.02061	0.03362

Mortality rates for PLHIV on ART (CD4 ≥500)

Region	Gender	Ethnicity	Risk	Pt. Estimate	Lower	Upper
South	Male	White	PWID	0.00087	0.00054	0.00142
South	Male	White	MSM	0.00030	0.00021	0.00044
South	Male	White	MWID	0.00069	0.00044	0.00110
South	Male	White	HET	0.00038	0.00024	0.00061
South	Male	Black	PWID	0.00076	0.00051	0.00114
South	Male	Black	MSM	0.00026	0.00018	0.00039
South	Male	Black	MWID	0.00061	0.00037	0.00099
South	Male	Black	HET	0.00033	0.00022	0.00050
South	Male	Hispanic	PWID	0.00044	0.00027	0.00077
South	Male	Hispanic	MSM	0.00015	0.00009	0.00025
South	Male	Hispanic	MWID	0.00035	0.00019	0.00065
South	Male	Hispanic	HET	0.00019	0.00011	0.00035
South	Female	White	PWID	0.00067	0.00041	0.00117
South	Female	White	HET	0.00029	0.00019	0.00048
South	Female	Black	PWID	0.00059	0.00038	0.00088
South	Female	Black	HET	0.00026	0.00018	0.00037
South	Female	Hispanic	PWID	0.00034	0.00020	0.00063
South	Female	Hispanic	HET	0.00015	0.00009	0.00026
Northeast	Male	White	PWID	0.00080	0.00049	0.00129
Northeast	Male	White	MSM	0.00028	0.00020	0.00039
Northeast	Male	White	MWID	0.00064	0.00041	0.00096
Northeast	Male	White	HET	0.00035	0.00022	0.00056
Northeast	Male	Black	PWID	0.00070	0.00046	0.00103
Northeast	Male	Black	MSM	0.00024	0.00017	0.00035
Northeast	Male	Black	MWID	0.00056	0.00035	0.00091
Northeast	Male	Black	HET	0.00030	0.00020	0.00045
Northeast	Male	Hispanic	PWID	0.00040	0.00023	0.00068
Northeast	Male	Hispanic	MSM	0.00014	0.00009	0.00022
Northeast	Male	Hispanic	MWID	0.00032	0.00018	0.00059
Northeast	Male	Hispanic	HET	0.00018	0.00011	0.00030
Northeast	Female	White	PWID	0.00062	0.00039	0.00100
Northeast	Female	White	HET	0.00027	0.00017	0.00042
Northeast	Female	Black	PWID	0.00054	0.00035	0.00086
Northeast	Female	Black	HET	0.00024	0.00016	0.00033
Northeast	Female	Hispanic	PWID	0.00031	0.00019	0.00057
Northeast	Female	Hispanic	HET	0.00014	0.00008	0.00022
West	Male	White	PWID	0.00079	0.00044	0.00137
West	Male	White	MSM	0.00027	0.00019	0.00041
West	Male	White	MWID	0.00063	0.00039	0.00101
West	Male	White	HET	0.00034	0.00019	0.00057
West	Male	Black	PWID	0.00069	0.00042	0.00120
West	Male	Black	MSM	0.00024	0.00015	0.00039
West	Male	Black	MWID	0.00055	0.00033	0.00097
West	Male	Black	HET	0.00030	0.00018	0.00050
West	Male	Hispanic	PWID	0.00040	0.00022	0.00070
West	Male	Hispanic	MSM	0.00014	0.00008	0.00024
West	Male	Hispanic	MWID	0.00032	0.00016	0.00062
West	Male	Hispanic	HET	0.00017	0.00009	0.00034
West	Female	White	PWID	0.00061	0.00035	0.00108
West	Female	White	HET	0.00026	0.00016	0.00045
West	Female	Black	PWID	0.00053	0.00031	0.00093
West	Female	Black	HET	0.00023	0.00014	0.00039
West	Female	Hispanic	PWID	0.00031	0.00017	0.00057
West	Female	Hispanic	HET	0.00013	0.00008	0.00025

Mortality rates for PLHIV on ART (CD4 200-499)

Region	Gender	Ethnicity	Risk	Pt. Estimate	Lower	Upper
South	Male	White	PWID	0.00132	0.00093	0.00196
South	Male	White	MSM	0.00059	0.00045	0.00079
South	Male	White	MWID	0.00094	0.00063	0.00138
South	Male	White	HET	0.00084	0.00060	0.00122
South	Male	Black	PWID	0.00107	0.00078	0.00144
South	Male	Black	MSM	0.00048	0.00036	0.00067
South	Male	Black	MWID	0.00076	0.00050	0.00112
South	Male	Black	HET	0.00068	0.00052	0.00089
South	Male	Hispanic	PWID	0.00073	0.00050	0.00108
South	Male	Hispanic	MSM	0.00033	0.00023	0.00048
South	Male	Hispanic	MWID	0.00052	0.00033	0.00083
South	Male	Hispanic	HET	0.00046	0.00032	0.00067
South	Female	White	PWID	0.00135	0.00092	0.00199
South	Female	White	HET	0.00086	0.00060	0.00126
South	Female	Black	PWID	0.00109	0.00079	0.00153
South	Female	Black	HET	0.00069	0.00050	0.00093
South	Female	Hispanic	PWID	0.00074	0.00051	0.00118
South	Female	Hispanic	HET	0.00047	0.00032	0.00069
Northeast	Male	White	PWID	0.00140	0.00098	0.00203
Northeast	Male	White	MSM	0.00063	0.00047	0.00085
Northeast	Male	White	MWID	0.00098	0.00069	0.00144
Northeast	Male	White	HET	0.00090	0.00062	0.00129
Northeast	Male	Black	PWID	0.00113	0.00083	0.00155
Northeast	Male	Black	MSM	0.00051	0.00037	0.00070
Northeast	Male	Black	MWID	0.00080	0.00054	0.00116
Northeast	Male	Black	HET	0.00072	0.00053	0.00099
Northeast	Male	Hispanic	PWID	0.00077	0.00054	0.00112
Northeast	Male	Hispanic	MSM	0.00034	0.00024	0.00049
Northeast	Male	Hispanic	MWID	0.00054	0.00035	0.00083
Northeast	Male	Hispanic	HET	0.00049	0.00034	0.00069
Northeast	Female	White	PWID	0.00142	0.00098	0.00218
Northeast	Female	White	HET	0.00091	0.00062	0.00132
Northeast	Female	Black	PWID	0.00115	0.00080	0.00162
Northeast	Female	Black	HET	0.00073	0.00054	0.00101
Northeast	Female	Hispanic	PWID	0.00078	0.00052	0.00117
Northeast	Female	Hispanic	HET	0.00050	0.00034	0.00070
West	Male	White	PWID	0.00165	0.00110	0.00246
West	Male	White	MSM	0.00074	0.00056	0.00099
West	Male	White	MWID	0.00116	0.00078	0.00167
West	Male	White	HET	0.00105	0.00070	0.00158
West	Male	Black	PWID	0.00133	0.00092	0.00194
West	Male	Black	MSM	0.00060	0.00043	0.00085
West	Male	Black	MWID	0.00094	0.00061	0.00145
West	Male	Black	HET	0.00085	0.00058	0.00125
West	Male	Hispanic	PWID	0.00090	0.00059	0.00135
West	Male	Hispanic	MSM	0.00041	0.00028	0.00060
West	Male	Hispanic	MWID	0.00064	0.00039	0.00105
West	Male	Hispanic	HET	0.00058	0.00039	0.00085
West	Female	White	PWID	0.00167	0.00105	0.00267
West	Female	White	HET	0.00107	0.00074	0.00159
West	Female	Black	PWID	0.00135	0.00089	0.00206
West	Female	Black	HET	0.00086	0.00058	0.00124
West	Female	Hispanic	PWID	0.00092	0.00058	0.00147
West	Female	Hispanic	HET	0.00059	0.00038	0.00088

Mortality rates for PLHIV on ART (CD4 <200)

Region	Gender	Ethnicity	Risk	Pt. Estimate	Lower	Upper
South	Male	White	PWID	0.00798	0.00604	0.01086
South	Male	White	MSM	0.00556	0.00444	0.00704
South	Male	White	MWID	0.00891	0.00662	0.01184
South	Male	White	HET	0.00498	0.00375	0.00639
South	Male	Black	PWID	0.00718	0.00565	0.00895
South	Male	Black	MSM	0.00500	0.00407	0.00619
South	Male	Black	MWID	0.00802	0.00597	0.01061
South	Male	Black	HET	0.00449	0.00368	0.00550
South	Male	Hispanic	PWID	0.00616	0.00460	0.00826
South	Male	Hispanic	MSM	0.00429	0.00334	0.00546
South	Male	Hispanic	MWID	0.00688	0.00499	0.00946
South	Male	Hispanic	HET	0.00384	0.00294	0.00501
South	Female	White	PWID	0.00856	0.00620	0.01190
South	Female	White	HET	0.00534	0.00405	0.00706
South	Female	Black	PWID	0.00770	0.00591	0.00991
South	Female	Black	HET	0.00481	0.00384	0.00595
South	Female	Hispanic	PWID	0.00661	0.00472	0.00928
South	Female	Hispanic	HET	0.00412	0.00305	0.00550
Northeast	Male	White	PWID	0.00426	0.00317	0.00585
Northeast	Male	White	MSM	0.00295	0.00226	0.00388
Northeast	Male	White	MWID	0.00475	0.00362	0.00646
Northeast	Male	White	HET	0.00265	0.00197	0.00354
Northeast	Male	Black	PWID	0.00384	0.00297	0.00508
Northeast	Male	Black	MSM	0.00266	0.00206	0.00341
Northeast	Male	Black	MWID	0.00428	0.00318	0.00599
Northeast	Male	Black	HET	0.00239	0.00186	0.00301
Northeast	Male	Hispanic	PWID	0.00328	0.00241	0.00450
Northeast	Male	Hispanic	MSM	0.00228	0.00171	0.00302
Northeast	Male	Hispanic	MWID	0.00366	0.00260	0.00510
Northeast	Male	Hispanic	HET	0.00204	0.00152	0.00273
Northeast	Female	White	PWID	0.00457	0.00323	0.00626
Northeast	Female	White	HET	0.00284	0.00205	0.00395
Northeast	Female	Black	PWID	0.00412	0.00311	0.00558
Northeast	Female	Black	HET	0.00256	0.00196	0.00336
Northeast	Female	Hispanic	PWID	0.00352	0.00246	0.00492
Northeast	Female	Hispanic	HET	0.00219	0.00161	0.00300
West	Male	White	PWID	0.00566	0.00413	0.00796
West	Male	White	MSM	0.00393	0.00311	0.00507
West	Male	White	MWID	0.00632	0.00478	0.00855
West	Male	White	HET	0.00353	0.00258	0.00484
West	Male	Black	PWID	0.00510	0.00370	0.00716
West	Male	Black	MSM	0.00355	0.00268	0.00463
West	Male	Black	MWID	0.00569	0.00412	0.00792
West	Male	Black	HET	0.00318	0.00235	0.00432
West	Male	Hispanic	PWID	0.00437	0.00307	0.00616
West	Male	Hispanic	MSM	0.00303	0.00217	0.00413
West	Male	Hispanic	MWID	0.00487	0.00333	0.00711
West	Male	Hispanic	HET	0.00272	0.00195	0.00375
West	Female	White	PWID	0.00608	0.00423	0.00860
West	Female	White	HET	0.00378	0.00268	0.00526
West	Female	Black	PWID	0.00547	0.00386	0.00775
West	Female	Black	HET	0.00341	0.00249	0.00469
West	Female	Hispanic	PWID	0.00468	0.00313	0.00682
West	Female	Hispanic	HET	0.00292	0.00207	0.00415