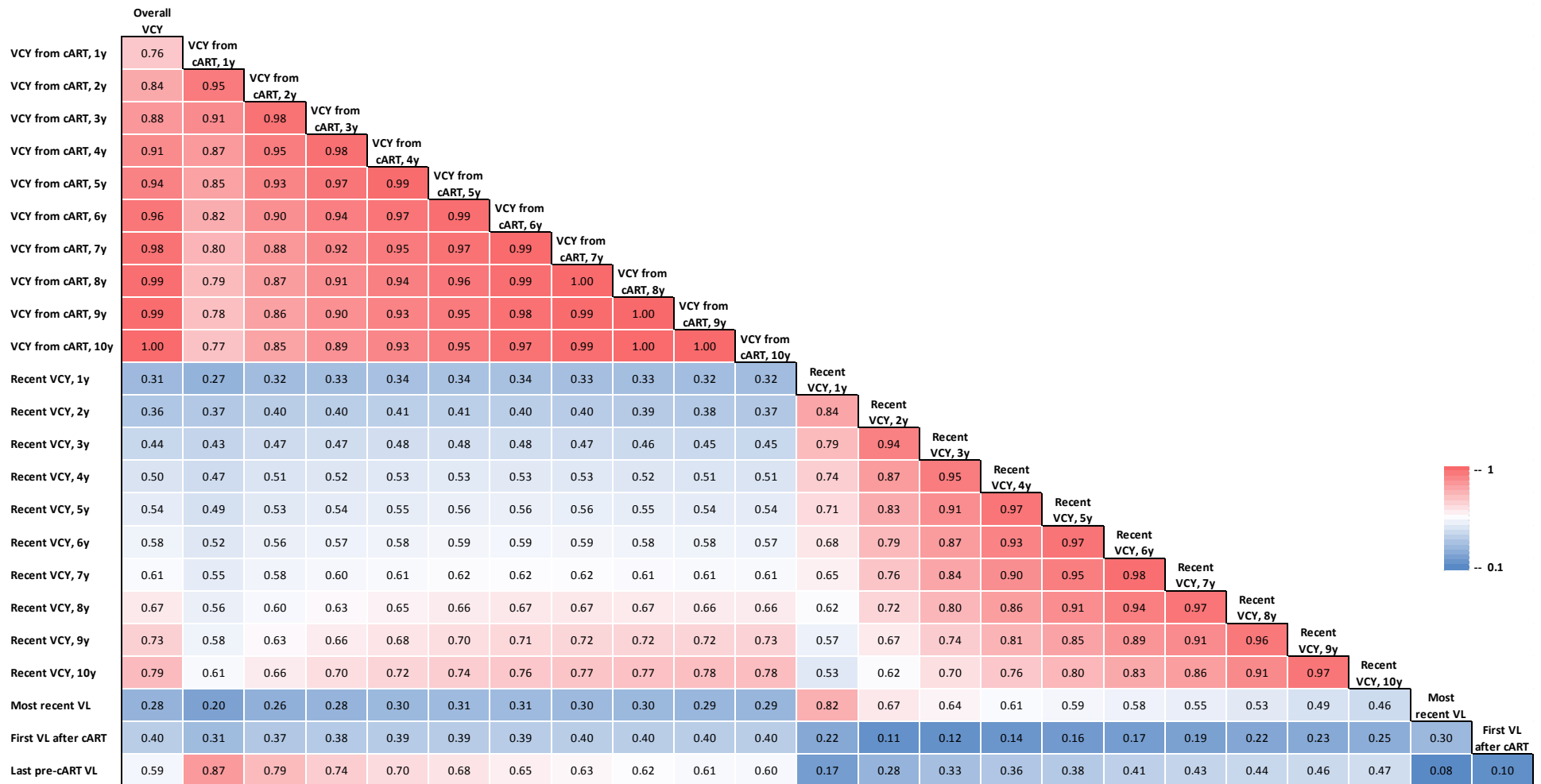


Supplementary Figure 1. Flow-chart showing selection of study cohort

Abbreviations: VL, viral load; cART, combination antiretroviral therapy; MACS, Multicenter AIDS Cohort Study

Supplementary Figure 2. Spearman's rank-order correlation matrix for 21 VCY and 3 VL measurements at 12,373 person-visits over the course of 6,736 person-years.



Supplementary Table 1. Adjusted percent changes in survival times for viremia copy-years and cross-sectional viral load measurements in Model B*

	% Change in survival time† (95% CI)			
	VCY measures	Last pre-cART VL	Most recent VL	First post-cART VL
Overall VCY	-4 (-36, 27)	-0 (-26, 26)	-13 (-28, 1)	-8 (-24, 8)
VCY from cART, 1y	11 (-44, 66)	-9 (-45, 28)	-14 (-28, -0)	-11 (-29, 7)
VCY from cART, 2y	1 (-36, 37)	-3 (-31, 25)	-14 (-28, 0)	-9 (-26, 8)
VCY from cART, 3y	-9 (-40, 22)	2 (-26, 31)	-13 (-27, 1)	-7 (-24, 10)
VCY from cART, 4y	-11 (-42, 19)	3 (-25, 32)	-13 (-27, 2)	-7 (-24, 10)
VCY from cART, 5y	-9 (-40, 22)	2 (-26, 30)	-13 (-28, 2)	-7 (-24, 10)
VCY from cART, 6y	-6 (-37, 26)	0 (-26, 27)	-13 (-28, 1)	-8 (-24, 9)
VCY from cART, 7y	-1 (-33, 31)	-2 (-27, 23)	-14 (-28, 0)	-9 (-24, 7)
VCY from cART, 8y	-1 (-32, 31)	-2 (-27, 23)	-14 (-28, 0)	-9 (-24, 7)
VCY from cART, 9y	-1 (-32, 31)	-2 (-27, 23)	-14 (-28, 0)	-9 (-24, 7)
VCY from cART, 10y	-1 (-33, 30)	-2 (-27, 23)	-14 (-28, 1)	-8 (-24, 7)
Recent VCY, 1y	-9 (-29, 11)	-1 (-22, 20)	-8 (-27, 11)	-8 (-23, 7)
Recent VCY, 2y	-15 (-32, 2)	1 (-21, 23)	-7 (-24, 10)	-6 (-21, 8)
Recent VCY, 3y	-21 (-37, -6)	5 (-18, 27)	-5 (-22, 11)	-5 (-20, 9)
Recent VCY, 4y	-20 (-36, -4)	5 (-18, 28)	-7 (-23, 9)	-5 (-20, 10)
Recent VCY, 5y	-22 (-39, -5)	7 (-17, 31)	-8 (-24, 8)	-5 (-21, 11)
Recent VCY, 6y	-25 (-43, -6)	9 (-17, 35)	-8 (-23, 8)	-5 (-21, 11)

Recent VCY, 7y	-24 (-43, -5)	9 (-18, 36)	-8 (-24, 7)	-5 (-21, 12)
Recent VCY, 8y	-22 (-43, -2)	8 (-19, 35)	-9 (-25, 6)	-5 (-22, 12)
Recent VCY, 9y	-17 (-40, 5)	6 (-20, 32)	-11 (-26, 5)	-6 (-23, 10)
Recent VCY, 10y	-17 (-41, 6)	6 (-21, 32)	-11 (-27, 4)	-6 (-23, 11)

Bold indicates statistical significance

* Model B evaluated each VCY measure jointly with the three cross-sectional VLs (last pre-cART VL, first VL after cART and the most recent VL) after adjusting for demographic and clinical factors, including age (per 10-year increase), non-Caucasian race, most recent CD4+ T cell count (per 100 cells/mm³ increase with linear spline at 200 cells/mm³), baseline CD4+ T cell count (per 100 cells/mm³ increase), AIDS diagnosis prior to cART initiation, MACS study site and cohort enrollment.

† Percent change in survival times were estimated for each 10-fold increase in the 21 VCY measures (copy-years/mL) and 3 cross-sectional VLs (copies/mL)

Abbreviations: VCY, viremia copy-years; VL, viral load; cART, combination antiretroviral therapy; CI, confidence interval; AIC, Akaike Information Criteria

Supplementary Table 2. Comparing VCY measures with changing assumptions for **undetectable**

viral load

	Model A*		Model A + 3 cross-sectional VLs*	
	% Change in survival time† (95% CI)	AIC	% Change in survival time (95% CI)	AIC
Overall VCY	-18 (-39, 4)	456.2	-4 (-36, 27)	458.5
Overall VCY (undetectable VL = 0)	-18 (-38, 1)	455.5	-10 (-38, 18)	458.1
Overall VCY (undetectable VL = 10)	-18 (-38, 2)	455.8	-8 (-38, 21)	458.3

Bold indicates statistical significance

* Model A was adjusted for age (per 10-year increase), non-Caucasian race, most recent CD4+ T cell count (per 100 cells/mm³ increase with linear spline at 200 cells/mm³), baseline CD4+ T cell count (per 100 cells/mm³ increase), clinically defined AIDS diagnosis prior to cART initiation, MACS study site and enrollment cohort. Three cross-sectional VLs included baseline VL, first VL after cART initiation and the most recent VL.

† Percent change in survival times were estimated for each 10-fold increase in VCY measures.

Abbreviations: VCY, viremia copy-years; VL, viral load; CI, confidence interval; AIC, Akaike

Information Criteria

Supplementary Table 3. Adjusted percent changes in survival times for viremia copy-year measurements among 432 cART-initiators with no prior exposure to antiretroviral mono- or dual-therapy

	Model A*		Model A + 3 cross-sectional VLs*	
	% Change in survival time† (95% CI)	AIC	% Change in survival time† (95% CI)	AIC
Overall VCY	-10 (-37, 18)	131.3	20 (-53, 92)	134.7
VCY from cART, 1y	-4 (-33, 24)	131.5	65 (-81, 210)	134.4
VCY from cART, 2y	-4 (-31, 23)	131.5	57 (-61, 175)	134.3
VCY from cART, 3y	-15 (-38, 9)	131.2	10 (-56, 76)	134.9
VCY from cART, 4y	-14 (-38, 10)	131.2	16 (-55, 86)	134.9
VCY from cART, 5y	-13 (-39, 12)	131.2	19 (-54, 92)	134.8
VCY from cART, 6y	-9 (-36, 18)	131.4	36 (-45, 116)	134.5
VCY from cART, 7y	-6 (-34, 21)	131.4	41 (-36, 117)	134.3
VCY from cART, 8y	-7 (-34, 20)	131.4	34 (-40, 109)	134.4
VCY from cART, 9y	-7 (-34, 20)	131.4	33 (-40, 106)	134.4
VCY from cART, 10y	-8 (-36, 19)	131.4	25 (-48, 98)	134.6
Recent VCY, 1y	-12 (-34, 10)	130.8	7 (-41, 55)	134.9
Recent VCY, 2y	-11 (-32, 10)	131.0	3 (-34, 40)	134.9
Recent VCY, 3y	-31 (-42, -20)	126.2	-30 (-45, -15)	131.3
Recent VCY, 4y	-27 (-40, -13)	128.4	-24 (-43, -6)	133.1
Recent VCY, 5y	-24 (-40, -8)	129.3	-21 (-43, 2)	133.9
Recent VCY, 6y	-29 (-45, -12)	128.7	-26 (-49, -4)	133.4
Recent VCY, 7y	-25 (-44, -6)	129.6	-21 (-48, 7)	134.2
Recent VCY, 8y	-22 (-43, -0)	130.3	-14 (-47, 18)	134.6
Recent VCY, 9y	-17 (-41, 7)	130.8	-6 (-46, 33)	134.9
Recent VCY, 10y	-22 (-43, -1)	130.5	-13 (-49, 23)	134.8

Bold indicates statistical significance

* Model A was adjusted for age (per 10-year increase), non-Caucasian race, most recent CD4+ T cell count (per 100 cells/mm³ increase with linear spline at 200 cells/mm³), baseline CD4+ T cell count (per 100 cells/mm³ increase), clinically defined AIDS diagnosis prior to cART initiation, MACS study site and enrollment cohort. Three cross-sectional VLs included baseline VL, first VL after cART initiation and the most recent VL.

† Percent change in survival times were estimated for each 10-fold increase in the 21 VCY measurements (copy-years/mL)

Abbreviations: VCY, viremia copy-years; VL, viral load; cART, combination antiretroviral therapy; CI, confidence interval; AIC, Akaike Information Criteria

Supplementary Table 4. Adjusted percent changes in survival times for AIDS and non-AIDS-related mortality

	Model A: % Change in survival time (95% CI)		Model B: % Change in survival time (95% CI)	
	AIDS deaths	Non-AIDS deaths	AIDS deaths	Non-AIDS deaths
Overall VCY	-33 (-59, -6)	-6 (-42, 30)	-4 (-42, 34)	-5 (-57, 46)
VCY from cART, 1y	-25 (-46, -3)	-2 (-38, 34)	13 (-56, 81)	16 (-84, 115)
VCY from cART, 2y	-32 (-54, -10)	2 (-35, 39)	-13 (-53, 26)	30 (-52, 113)
VCY from cART, 3y	-36 (-58, -13)	-3 (-38, 33)	-20 (-54, 14)	9 (-52, 70)
VCY from cART, 4y	-37 (-61, -14)	-4 (-39, 31)	-23 (-58, 12)	4 (-52, 60)
VCY from cART, 5y	-37 (-62, -13)	-4 (-40, 31)	-21 (-56, 14)	2 (-52, 56)
VCY from cART, 6y	-38 (-63, -13)	-2 (-38, 33)	-22 (-57, 14)	7 (-49, 62)
VCY from cART, 7y	-36 (-62, -10)	-2 (-37, 34)	-15 (-52, 23)	8 (-47, 62)
VCY from cART, 8y	-36 (-62, -10)	-2 (-37, 34)	-13 (-50, 25)	7 (-46, 60)
VCY from cART, 9y	-34 (-61, -8)	-2 (-38, 33)	-9 (-47, 28)	5 (-47, 57)
VCY from cART, 10y	-34 (-60, -7)	-3 (-38, 32)	-7 (-44, 31)	3 (-49, 55)
Recent VCY, 1y	-26 (-40, -12)	-1 (-28, 25)	-11 (-36, 13)	5 (-42, 51)
Recent VCY, 2y	-30 (-44, -16)	1 (-27, 29)	-21 (-41, -1)	8 (-32, 49)
Recent VCY, 3y	-34 (-48, -20)	-8 (-34, 18)	-27 (-45, -9)	-8 (-39, 22)
Recent VCY, 4y	-32 (-48, -16)	-13 (-38, 13)	-21 (-42, -0)	-16 (-44, 12)
Recent VCY, 5y	-31 (-48, -13)	-21 (-44, 3)	-17 (-40, 6)	-27 (-53, -2)
Recent VCY, 6y	-34 (-52, -15)	-23 (-48, 2)	-20 (-44, 3)	-32 (-59, -4)
Recent VCY, 7y	-32 (-53, -12)	-24 (-49, 0)	-17 (-43, 9)	-35 (-62, -9)

Recent VCY, 8y	-35 (-55, -14)	-22 (-49, 5)	-19 (-46, 7)	-32 (-61, -3)
Recent VCY, 9y	-33 (-56, -11)	-18 (-47, 12)	-16 (-45, 13)	-26 (-59, 7)
Recent VCY, 10y	-33 (-56, -10)	-19 (-49, 10)	-14 (-44, 16)	-31 (-62, 1)

Bold indicates statistical significance

* Model A was adjusted for age (per 10-year increase), non-Caucasian race, most recent CD4+ T cell count (per 100 cells/mm³ increase with linear spline at 200 cells/mm³), baseline CD4+ T cell count (per 100 cells/mm³ increase), AIDS diagnosis prior to cART initiation, MACS study site and cohort enrollment

† Model B evaluated each VCY measure jointly with the three cross-sectional VLs (last pre-cART VL, first VL after cART and the most recent VL) after adjusting for all demographic and clinical factors included in Model A. Among the three cross-sectional VLs, adjusted percent change in survival times are only shown for the most recent VL.

‡ Percent change in survival times was estimated for each 10-fold increase in the 21 VCY measures (copy-years/mL)

Abbreviations: VCY, viremia copy-years; VL, viral load; cART, combination antiretroviral therapy; MACS, Multicenter AIDS Cohort Study; CI, confidence interval
