

**Behavioral changes following HIV seroconversion during the historical expansion of HIV
treatment in the United States**

Supplemental Materials

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Observations	8,447	3,641	3,603	6,612	3,270	5,245
	0?566	0?431	0?462	0?412	0?478	0?392
	0?112	0?073	0?049	0?057	0?126	0?123

Panel B: Mediation by Mental Health

	(8)	(9)	(10)	(11)	(12)	(13)
Pre-conversion)	0?351	0?369	1?045	0?659	1?208	0?748
	(0?248, 0?498)	(0?224, 0?607)	(0?642, 1?703)	(0?473, 0?919)	(0?698, 2?088)	(0?466, 1?202)
Scale Control	Yes	Yes	Yes	Yes	Yes	Yes
Effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,672	3,756	3,654	6,749	3,438	5,331

0?572	0?439	0?459	0?418	0?480	0?403
0?103	0?068	0?047	0?059	0?127	0?126

presents odds ratios from logit regressions showing the associations of HIV seroconversion with subsequent risk behaviors, with mediation by physical health (columns (1)-(7)) and mental health (columns (8)-(14)). All regressions are restricted to participants who seroconverted (n=558). Each column is a separate regression on one of the seven outcomes of interest (defined in the text) representing sexual behavior, alcohol use, and injection drug use. Columns (1)-(7) control for CD4 count and CD4 count squared. Columns (8)-(14) control for CES-D score (out of 60). All regressions also control for (results not shown) random effects, time trend and its interaction with high school degree, age interacted with high school degree, and time trend interacted with baseline level of each corresponding dependent variable. Sample size is less than the full sample and changes across columns because of missing values in the dependent variables, which differ across columns. Specifically, the variables in columns (1)-(3), (5), (6), (8), (9), (10), (12), (13), and (14) are conditional on someone having 2+ male sexual partners; the variable in column (4) and (11) is conditional on having any drink in the period; we miss additional observations in columns (1)-(3), (5), (6), (8), (9), (10), (12), (13), and (14) as a consequence of (1) missing self-reported data, (2) requiring one-period forward values, and (3) logit estimation dropping observations because of all positive/negative outcomes. Standard errors (in parentheses) are based on standard errors adjusted for clustering at the individual level.

Table A2. Heterogeneous associations of HIV seroconversion with subsequent risk behaviors by exposure to HIV treatment with mediation by physical health variables among MACS participants who seroconverted during observation (n=558)

	Dependent Variable: dummy variable γ in $t+1$						
		insertive anal sex with 2+ partners	receptive anal sex with 2+ partners	3+ drinks/day if drinking	smoke 1/2+ packs/day	monthly+ marijuana	monthly+ poppers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
pre-1996: post-conversion vs. pre-conversion	0?468 (0?317, 0?690)	0?579 (0?323, 1?041)	1?300 (0?754, 2?241)	0?902 (0?636, 1?281)	1?571 (0?820, 3?011)	0?708 (0?432, 1?161)	0?935 (0?600, 1?457)
post-1996: post-conversion vs. pre-	0?286	0?277	2?204	0?768	0?507	1?615	0?424

conversion

	(0?120, 0?682)	(0?145, 0?527)	(1?012, 4?801)	(0?312, 1?887)	(0?214, 1?201)	(0?513, 5?085)	(0?177, 1?015)
Quadratic CD4 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey Wave Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual-Wave Observations	8,447	3,641	3,603	6,612	3,270	5,245	6,152
Pre-1996=Post-1996 (P-value)	0?266	0?028	0?176	0?730	0?018	0?169	0?059
Dep. Var. Mean	0?566	0?431	0?462	0?412	0?478	0?392	0?348
Adjusted R-squared	0?113	0?075	0?051	0?058	0?129	0?124	0?130

Panel B: Definition of exposure to HIV treatment: HIV treatment initiation

(8)	(9)	(10)	(11)	(12)	(13)	(14)
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without treatment: post-conversion vs.

pre-conversion	0?451	0?582	1?476	0?911	1?342	0?773	0?877
	(0?309,	(0?342,	(0?881,	(0?650,	(0?744,	(0?481,	(0?566,
	0?660)	0?991)	2?473)	1?278)	2?422)	1?241)	1?357)

with treatment: post-conversion vs. pre-

conversion	0?335	0?293	1?379	0?552	0?716	0?814	0?523
	(0?213,	(0?149,	(0?757,	(0?343,	(0?311,	(0?417,	(0?281,
	0?526)	0?575)	2?512)	0?887)	1?650)	1?590)	0?973)

Quadratic CD4 Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey Wave Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual-Wave Observations	8,447	3,641	3,603	6,612	3,270	5,245	6,152
Pre-treatment=Post-treatment (P-value)	0?070	0?002	0?738	0?004	0?096	0?825	0?013
Dep. Var. Mean	0?566	0?431	0?462	0?412	0?478	0?392	0?348
Adjusted R-squared	0?113	0?079	0?049	0?060	0?130	0?123	0?132

Notes: The table reports odds ratios from logit regressions showing the heterogeneous associations of HIV seroconversion with subsequent risk behaviors by exposure to HIV treatment, with mediation by physical health variables (CD4 count and CD4 count squared). Regressions are restricted to participants who seroconverted (n=558). Each column is a separate regression on one of the seven outcomes of interest (defined in the text) representing sexual behavior, drinking, smoking, and recreational drug use. All regressions also control for (results not shown) individual fixed effects, survey wave fixed effects, indicator of exposure to HIV treatment, time trend and its interaction with high school degree, age interacted with high school degree, and time trend interacted with baseline level of each corresponding dependent variable. The number of observations is less than the full sample and changes across columns because of missing values in the dependent variables, which differ across columns. Specifically, the variables in columns (2), (3), (9) and (10) are covered in waves 8-49, and are conditional on someone having 2+ male sexual partners; the variable in column (4) and (11) is conditional on having any drink in the period; we miss additional observations for all the dependent variables as a consequence of (1) missing self-reported data, (2) requiring one-period forward values, and (3) logit estimation dropping observations because of all positive/negative outcomes. All 95% Confidence Intervals (in parentheses) are based on standard errors adjusted for clustering at the individual level.

Individual Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey Wave Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual-Wave Observations	8,672	3,756	3,654	6,749	3,438	5,331	6,391
Pre-treatment=Post-treatment (P-value)	0.005	0.001	0.313	0.004	0.062	0.821	0.000
Var. Mean	0.572	0.439	0.459	0.418	0.480	0.403	0.351
Adjusted R-squared	0.106	0.074	0.047	0.062	0.133	0.126	0.111

The table reports odds ratios from logit regressions showing the heterogeneous associations of HIV seroconversion with subsequent risk behaviors by exposure to HIV treatment, variation by mental health variable (CES-D score out of 60). Regressions are restricted to participants who seroconverted (n=558). Each column is a separate regression on one of the seven outcomes of interest (defined in the text) representing sexual behavior, drinking, smoking, and recreational drug use. All regressions also control for (results not shown) individual fixed effects, survey wave fixed effects, indicator of exposure to HIV treatment, time trend and its interaction with high school degree, age interacted with high school degree, and time trend interacted with baseline level of each corresponding dependent variable. The number of observations is less than the full sample and changes across columns because of missing values in the dependent variables, which differ across columns. Specifically, the variables in columns (2), (3), (9) and (10) are covered in waves 8-49, and are conditional on someone having 2+ male sexual partners; the variable in column (4) and (11) is conditional on having any drink in the period; we miss additional observations for all the dependent variables as a consequence of (1) missing reported data, (2) requiring one-period forward values, and (3) logit estimation dropping observations because of all positive/negative outcomes. All 95% Confidence Intervals (in parentheses) are based on standard errors adjusted for clustering at the individual level.

Table A4. One-period attrition with and without deaths included

	Probability of dropping out of sample in $t+1$ in sample in t					
	<u>Sample with Deaths</u>			<u>Sample without Deaths</u>		
	(1)	(2)	(3)	(4)	(5)	(6)
Sex with 2+ partners	-0?007	-0?002		0?006	0?005	
	(0?016)	(0?018)		(0?019)	(0?022)	
Smoke 1/2+ packs/day	0?007	0?013	0?000	0?002	0?005	0?012
	(0?019)	(0?020)	(0?033)	(0?023)	(0?024)	(0?038)
Monthly+ marijuana	0?002	0?004	-0?011	-0?030	-0?026	-0?043
	(0?017)	(0?018)	(0?031)	(0?018)	(0?020)	(0?034)
Monthly+ poppers	0?010	-0?002	0?007	0?030	0?015	0?019
	(0?015)	(0?016)	(0?025)	(0?018)	(0?019)	(0?027)
3+ drinks/day if drinking		-0?010	-0?007		-0?015	-0?001
		(0?014)	(0?023)		(0?016)	(0?024)
Insertive anal sex with 2+ partners 2+ partners			-0?010			0?006

			(0?023)			(0?026)
Receptive anal sex with 2+ partners 2+ partners			0?053			0?046
			(0?026)			(0?029)
Post-conversion X sex with 2+ partners	-0?019	-0?017	-0?003	-0?016	-0?017	
	(0?019)	(0?021)	(0?032)	(0?022)	(0?025)	
Post-conversion X smoke 1/2+ packs/day	0?004	0?002	-0?020	0?003	0?008	0?004
	(0?021)	(0?021)	(0?039)	(0?027)	(0?028)	(0?047)
Post-conversion X monthly+ marijuana	0?022	0?015	0?016	0?054	0?048	0?037
	(0?019)	(0?020)	(0?036)	(0?023)	(0?024)	(0?042)
Post-conversion X monthly+ poppers	-0?026	-0?011	0?007	-0?038	-0?023	-0?007
	(0?018)	(0?019)	(0?029)	(0?023)	(0?024)	(0?033)
Post-conversion X 3+ drinks/day if drinking		0?012	0?026		0?014	0?007
		(0?017)	(0?027)		(0?020)	(0?030)
Post-conversion X insertive anal sex with 2+ partners 2+ partners			0?012			0?004
			(0?027)			(0?031)
Post-conversion X receptive anal sex with 2+ partners 2+ partners			-0?070			-0?062
			(0?027)			(0?030)

Post-1996 Interaction	Yes	Yes	Yes	Yes	Yes	Yes
Individual Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Survey Wave Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Individual-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,307	10,256	4,597	8,386	7,053	3,567
Dep. Var. Mean	0?120	0?119	0?108	0?105	0?104	0?098
Adjusted R-squared	0?025	0?025	0?007	0?018	0?020	0?008

Notes: The table reports coefficient estimates from linear probability models showing next-period attrition as a function of current-period risk behaviors using the sample of 558 seroconverters. Estimates shown indicate how attrition is related to outcomes of interest overall and by HIV seroconversion status. Columns (1)-(3) use all MACS participants who seroconverted during observation (n=558). Columns (4)-(6) exclude individuals with known death records (n=290). Columns (1) and (4) use the full sample; columns (2) and (5) are based on a smaller sample where the drinking intensity variable is defined; columns (3) and (6) are based on a smaller sample where insertive and receptive anal sex variables are defined (the sex with 2+ partners variable is omitted due to collinearity). We miss additional observations for all the columns as a consequence of requiring one-period forward values. All regressions also control for (results not shown) individual fixed effects, survey wave fixed effects, time trend and its interaction with high school degree, age interacted with high school degree, and time trend interacted with baseline level of each of

the included dependent variables.

Table A5. Associations of HIV seroconversion with subsequent risk behaviors: full sample pooled cross section (n=4616)

	Dependent Variable: dummy variable ?in $t+1$						
		insertive anal sex with 2+ partners	receptive anal sex with 2+ partners	3+ drinks/day if drinking	smoke 1/2+ packs/day	monthly+ marijuana	monthly+ poppers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Currently HIV+ (vs. HIV-)	0?23 (0?47, 0?10)	0?47 (0?17, 1?00)	1?25 (1?48, 2?56)	0?71 (0?55, 1?06)	1?59 (0?57, 1?02)	1?02 (1?74, 1?75)	0?98 (0?46, 1?77)
Survey Wave Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual-Level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual-Wave Observations	55,860	23,482	23,474	46,876	56,591	56,158	56,143

Dep. Var. Mean	0.76	0.95	0.55	0.64	0.07	0.65	0.14
Adjusted R-squared	0.38	0.16	0.33	0.36	0.49	0.37	0.44

Notes: The table reports odds ratios from logit regressions showing the associations of HIV seroconversion with subsequent risk behaviors. Regressions use full sample including always HIV positive, always HIV negative, and seroconverters who became newly infected with HIV during the survey. Each column is a separate regression on one of the seven outcomes of interest (defined in the text) representing sexual behavior, drinking, smoking, and recreational drug use. All regressions also control for (results not shown) survey wave fixed effects, time trend, indicator of recruitment wave, indicator of non-Hispanic White, age, quadratic age, indicator of high school degree, indicator of college degree, and age interacted with high school degree. The number of observations is less than the full sample and changes across columns because of missing values in the dependent variables, which differ across columns. Specifically, the variables in columns (2) and (3) are covered in waves 8-49, and are conditional on someone having 2+ male sexual partners; the variable in column (4) is conditional on having any drink in the period; we miss additional observations for all the dependent variables as a consequence of (1) missing self-reported data, (2) requiring one-period forward values, and (3) logit estimation dropping observations because of all positive/negative outcomes. All 95% Confidence Intervals (in parentheses) are based on standard errors adjusted for clustering at the individual level.