

Supplemental Material

Use of viral load to improve survey estimates of known HIV-positive status and antiretroviral treatment coverage

Peter W. Young, Emily Zielinski-Gutierrez, Joyce Wamicwe, Irene Mukui, Andrea A. Kim, Anthony Waruru, Clement Zeh, Mirjam E. Kretzschmar, Kevin M. De Cock

Table S1. Self-reported HIV status and antiretroviral treatment (ART) use, KAIS 2012

Characteristic	Unaware n (%)	Aware, not on ART n (%)	Aware, on ART n (%)	N
Gender				
Male	120 (62.0)	22 (11.0)	51 (27.0)	193
Female	223 (47.8)	78 (17.5)	154 (34.7)	455
Age				
15-24 yrs	59 (82.0)	10 (10.9)	6 (7.1)	75
25-34 yrs	121 (58.9)	40 (20.0)	48 (21.1)	209
35-49 yrs	120 (44.1)	40 (14.8)	104 (41.1)	264
50-64 yrs	43 (43.1)	10 (8.9)	47 (48.0)	100
Marital status				
Single/never married	67 (73.5)	10 (9.8)	16 (16.7)	93
Married / cohabitating	210 (54.2)	57 (14.4)	118 (31.4)	385
Divorced / sep / widowed	66 (38.9)	33 (19.7)	71 (41.5)	170
Highest educational attainment				
None	49 (53.9)	12 (12.9)	28 (33.2)	89
Primary	192 (55.8)	60 (17.5)	94 (26.7)	346
Secondary	18 (57.4)	3 (11.2)	10 (31.4)	31
Higher	83 (47.4)	25 (11.9)	73 (40.8)	181
Employment				
Unemployed	124 (49.1)	33 (14.7)	82 (36.2)	239
Employed	218 (55.1)	67 (15.3)	123 (29.6)	408
Mobility				
Not away for >1 month in last year	196 (54.6)	52 (14.2)	112 (31.2)	360
Away >1 month in last year	131 (51.4)	45 (16.6)	87 (32.1)	263
ARV biomarker				
Present	55 (25.2)	12 (4.5)	168 (70.4)	235
Absent	233 (72.3)	73 (22.3)	18 (5.4)	324
UVL biomarker				
Present	65 (28.7)	25 (9.9)	145 (61.3)	235
Absent	253 (66.5)	74 (19.2)	55 (14.3)	382
Total	343 (53.1)	100 (15.1)	205 (31.8)	648

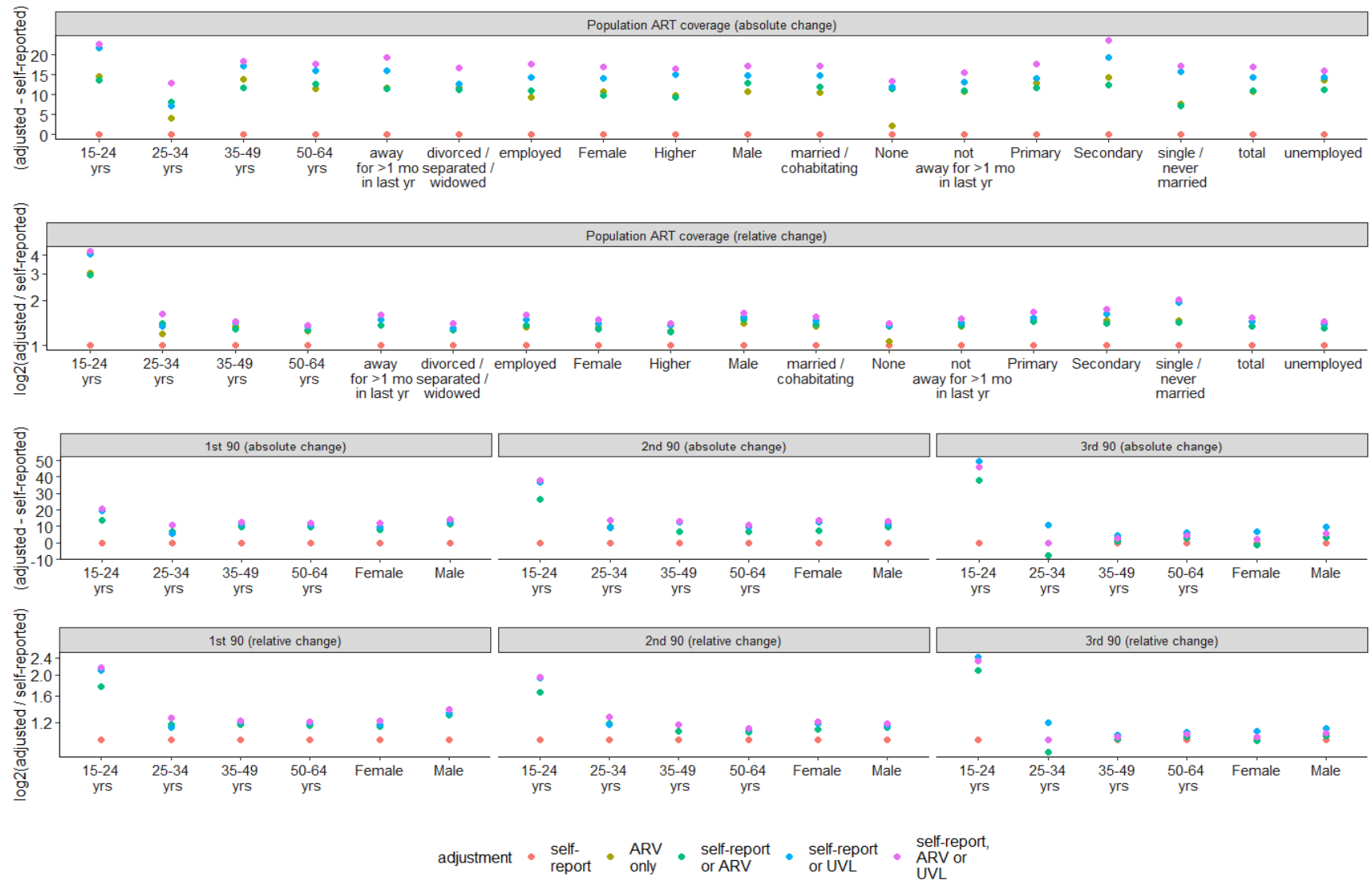
Note: ARV biomarker: test for presence of antiretrovirals in blood, UVL biomarker: present if respondent had undetectable viral load (<550 copies/mL) in blood. Missing values: one respondent was missing education and employment status, respectively, while 89 respondents were missing the ARV biomarker and 31 were missing viral load measure. Percentages are weighted to account for survey design.

Table S2. Comparison of antiretroviral (ARV) detection and undetectable viral load (UVL) by self-reported HIV status, KAIS 2012

Status	ARV biomarker	UVL biomarker			Total
		Present	Absent	Missing	
Unaware of HIV-positive status	present	40	15	0	55
	absent	14	209	10	233
	missing	11	29	15	55
	total	65	253	25	343
Aware of HIV-positive status, not on ART	present	8	3	1	12
	absent	12	61	0	73
	missing	5	10	0	15
	total	25	74	1	100
Aware of HIV-positive status, on ART	present	132	35	1	168
	absent	3	15	0	18
	missing	10	5	4	19
	total	145	55	5	205
Self-reported adherent last 30 days	present	116	3	9	128
	absent	27	11	4	42
	missing	1	0	14	15
	total	144	14	27	185
Self-reported non-adherent last 30 days	present	16	0	1	17
	absent	8	3	1	12
	missing	0	0	5	5
	total	24	3	7	34
	N	235	382	31	648

Note: ARV biomarker is present if ARVs detected in blood, UVL biomarker present if viral load undetectable (<550 copies/mL). Self-reported adherence is based on response to question among those who self-reported aware of HIV-positive status and on ART: 'In the last 30 days, have you missed taking any of your ARV pills?' One respondent who reported 'don't know' to this question was excluded from the self-reported adherence analysis.

Figure S1. Absolute and relative changes in ART coverage and HIV cascade indicators due to adjustment, by covariates, KAIS 2012



Note: relative differences are shown on log (2) scale, All differences are shown versus self-report. self-report: self-report only, self-report or ARV: either self-reported known-positive/on ART or ARVs detected, self-report or UVL: either self-reported known-positive/on ART or viral load was undetectable.

Table S3. Sensitivity analysis of self-reported and adjusted estimates of HIV care cascade restricted to participants with ARV and UVL biomarkers present, KAIS 2012

Characteristic		Self-report			Self-report or ARV			Self-report or UVL			Self-report, ARV or UVL		
Variable	level	n	%	se	n	%	se	n	%	se	n	%	se
Awareness of HIV infection (1st 90)													
Gender	Male	62	37.1	4.5	81	50.0	5.3	82	50.3	5.3	86	52.4	5.4
	Female	207	55.8	3.0	243	65.5	2.7	241	64.9	2.7	252	67.9	2.7
Age group	15–24 yrs	15	21.7	6.0	23	39.2	7.9	25	44.8	8.4	26	46.2	8.3
	25–34 yrs	76	42.0	4.6	90	50.3	4.7	86	46.9	4.7	95	53.0	4.7
	35–49 yrs	126	56.5	4.0	149	67.7	3.6	148	67.5	3.6	152	68.5	3.6
	50–64 yrs	52	58.5	5.8	62	69.4	5.5	64	71.2	5.3	65	72.0	5.3
Total		269	48.5	3.0	324	59.4	3.0	323	59.2	3.1	338	61.8	3.1
ART coverage among previously-diagnosed (2nd 90)													
Gender	Male	44	71.8	6.4	66	81.8	5.0	68	82.9	4.6	73	84.3	4.4
	Female	141	68.0	3.4	185	76.0	3.0	191	79.3	2.9	204	80.8	2.8
Age group	15–24 yrs	6	41.8	10.8	14	67.8	10.0	18	77.5	7.4	19	78.2	7.2
	25–34 yrs	42	51.8	6.4	58	61.8	5.7	55	60.5	5.9	65	65.5	5.6
	35–49 yrs	94	75.4	4.5	123	82.8	3.7	127	86.1	3.0	132	86.9	2.9
	50–64 yrs	43	84.9	5.4	56	92.4	3.7	59	93.6	2.9	61	95.0	2.6
Total		185	69.2	3.5	251	77.9	3.0	259	80.5	2.7	277	81.9	2.6
Viral suppression among those on ART (3rd 90)													
Gender	Male	32	75.5	6.4	49	78.0	5.1	56	84.3	4.4	56	79.6	4.8
	Female	108	76.5	4.0	139	75.3	3.6	158	82.7	3.0	158	77.6	3.3
Age group	15–24 yrs	2	34.6	19.8	9	72.4	11.3	14	82.9	7.8	14	79.7	8.4
	25–34 yrs	27	58.4	8.6	33	50.3	7.5	40	68.1	7.2	40	55.5	7.0
	35–49 yrs	77	83.3	4.2	101	84.8	3.6	110	87.8	3.1	110	85.7	3.3
	50–64 yrs	34	80.6	6.4	45	82.2	5.4	50	85.6	5.0	50	83.3	5.1
Total		140	76.2	3.4	188	76.2	3.0	214	83.2	2.5	214	78.2	2.7

Note: self-reported: self-report only, self-report or ARV: either self-reported known-positive/on ART or ARVs detected, self-report or UVL: either self-reported known-positive/on ART or viral load was undetectable, n: unweighted numerator, se: standard error, viral suppression defined as <1000 copies/mL. Percentages and standard errors are weighted and adjusted to account for the survey design.