

Supplementary Appendix

Supplementary Box 1. Steps taken to estimate the overall proportions of people living with HIV (PWH) alive* having viral load (VL) <1000 copies/mL in the IeDEA global consortium, by regions.

1) PWH in follow-up

a) With a viral load test:

- The number and proportion of PWH in care with VL <1000 copies/mL were obtained from available data at each time point.
- Plausible range of PWH with VL <1000 copies/mL was estimated by multiplying the number of PWH in our study who had VL test by the lowest and highest percentages suppressed, extracted from the literature on PWH on ART as follows:

Asia-Pacific: 68-89% for children/adolescents (1) and 80-96% for adults (2, 3)

CCASAnet: 57-91% for children/adolescents (4, 5) and 52-92% for adults (6)

NA-ACCORD: 73-89% for adults (7, 8)

Central, East, Southern, West Africa: 48-92% for children (9, 10) and 60-97% for adults (11, 12)

b) Without a viral load test:

- The number of PWH with VL <1000 copies/mL at each time point was obtained by multiplying the number with no VL test by the proportion with VL <1000 copies/mL in our study.
- Plausible range was estimated by multiplying the number of PWH without a VL test in our data by the lowest and highest percentages suppressed, extracted from the literature on PWH on ART.

2) PWH transferred out

- We estimated number of deaths among those transferred by applying the percent of death in PWH in follow-up in our data to the number of transferred PWH.
- Plausible range of death was obtained by applying the lowest and highest percentages of death reported for PWH on ART in the literature to the number of transferred PWH in our data as follow:

Asia-Pacific: 5-9% for children/adolescents (13, 14) and 4-6% for adults (15)

CCASAnet: 5-16% children/adolescents (16) and 1-9% for adults (6, 17)

Central, East, Southern, West Africa: 4-17% for children/adolescents (18, 19) and 1-18% for adults (20, 21)

- The estimated death was removed from those transferred.
- Number of PWH with VL <1000 copies/mL among transferred assumed to be alive was then obtained at each time point by using percent suppressed in our data.
- Plausible range with VL <1000 copies/mL among transferred PWH assumed to be alive, was obtained by applying the lowest and highest percent suppressed reported in literature on PWH on ART (the same figures as the PWH in care with viral load measurements).

3) PWH lost to follow-up

- The number of lost to follow-up PWH with known outcomes was obtained by applying the average (plausible range) percentages with known status among LTFU PWH reported in the tracing studies (75% [71%-86%]) (22-24).
- We estimated number of deaths among LTFU with known status by multiplying the average percentage of death among LTFU PWH reported in the tracing studies (75%) (22-24).
- Plausible range of death was obtained using the lowest and highest percentage of death among LTFU PWH reported in the tracing studies (71-86%) (22-24).
- The estimated number of deaths was removed from the total LTFU with known outcomes.
- Number of PWH with VL <1000 copies/mL in those who re-connected to care (unofficial transfers) was estimated by applying the percentage of suppressed VL (51%) reported for reconnected PWH in the tracing studies (24).
- Sensitivity analyses varying the common estimate of viral suppression among re-connected to care PWH were provided in the supplementary figures S1 and S2 (appendix pp 19-20).

Total estimated number with suppressed VL

This is the sum of PWH with VL <1000 copies estimated among the above 3 groups: PWH in follow-up (a and b), PWH who were transferred out and PWH who were classified as LTFU and reconnected to care.

*The included studies used different threshold to define viral suppression and the majority provided an overall proportion of virologically suppressed PWH among those in care, or LTFU without taking the duration of ART treatment into account.

Table S1. Unweighted and inverse-variance weighted of the proportions of VL outcomes, transfers, LTFU and mortality of children/adolescents and adults at year 1, 2 and 3 after ART initiation in the IeDEA global consortium

Children/Adolescents						
	VL<1000 copies/mL	VL≥1000 copies/mL	No VL measurement	Transfer out	LTFU	Death
Year 1	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)
Unweighted average	35.7 (35.00-36.3)	12.7 (12.2-13.2)	22.8 (22.3-23.4)	7.2 (6.8-7.5)	18.6 (18.0-19.1)	3.1 (2.9-3.3)
Fixed effects	35.9 (35.2-36.6)	12.7 (12.3-13.2)	23.0 (22.5-23.6)	7.9 (7.5-8.3)	20.1 (19.6-20.7)	3.6 (3.4-3.9)
Random effects	40.7 (33.2-48.6)	12.2 (11.2-13.3)	19.5 (16.4-23.0)	4.0 (2.3-7.1)	15.8 (10.2-23.7)	2.2 (1.1-4.2)
Year 2	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)
Unweighted average	29.8 (29.2-30.5)	10.1 (9.7-10.6)	18.2 (17.6-18.7)	12.4 (11.9-12.9)	25.8 (25.2-26.4)	3.7 (3.4-3.9)
Fixed effects	30.2 (29.5-30.9)	10.2 (9.8-10.6)	18.5 (17.9-19.1)	13.6 (13.1-14.1)	27.3 (26.6-28.0)	4.2 (3.9-4.5)
Random effects	33.1 (25.2-42.2)	10.0 (8.7-11.5)	15.5 (12.1-19.6)	6.8 (3.9-11.8)	25.5 (17.1-36.0)	2.7 (1.4-5.0)
Year 3	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)
Unweighted average	24.4 (23.7-25.0)	7.7 (7.3-8.1)	13.2 (12.7-13.7)	17.5 (16.9-18.1)	33.1 (32.4-33.8)	4.2 (3.9-4.5)
Fixed effects	25.2 (24.6-25.9)	7.8 (7.4 - 8.2)	13.9 (13.3-14.4)	18.9 (18.3 - 19.6)	33.9 (33.2-34.7)	4.8 (4.5-5.2)
Random effects	24.8 (16.2 - 36.0)	7.9 (6.7 - 9.3)	12.3 (8.4-17.7)	9.6 (5.6 - 16.1)	38.8 (27.1-52.0)	3.1 (1.7-5.7)
Adults						
Year 1	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)
Unweighted average	44.3 (44.1-44.5)	5.5 (5.4-5.6)	20.8 (20.7-21.0)	6.9 (6.8-7.0)	19.4 (19.3-19.6)	3.05 (3.0-3.1)
Fixed effects	44.1 (43.9-44.3)	5.6 (5.5-5.6)	21.3 (21.1-21.5)	8.0 (7.9-8.1)	19.8 (19.7-20.0)	3.1 (3.1-3.2)
Random effects	48.2 (40.9-55.5)	4.9 (4.0-5.9)	16.1 (12.7-20.1)	2.3 (1.3-4.2)	19.4 (14.7-25.2)	3.0 (2.3-3.8)

Year 2	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)
Unweighted average	35.8 (35.6-36.0)	4.2 (4.1-4.3)	16.9 (16.7-17.0)	11.2 (11.0-11.3)	28.0 (27.8-28.1)	4.0 (3.9-4.1)
Fixed effects	35.9 (35.7-36.1)	4.3 (4.2-4.4)	17.4 (17.2-17.5)	12.7 (12.5-12.8)	28.1 (28.0-28.3)	4.1 (4.0-4.2)
Random effects	38.3 (30.9-46.2)	3.4 (2.6-4.3)	12.3 (9.1-16.4)	3.9 (2.2-6.9)	31.3 (24.4-39.1)	3.9 (3.1-4.9)
Year 3	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)	Proportions (95% CI)
Unweighted average	28.8 (28.6-29.0)	3.2 (3.2-3.3)	12.2 (12.0-12.3)	15.0 (14.8-15.1)	36.0 (35.8-36.2)	4.8 (4.7-4.9)
Fixed effects	29.3 (29.1-29.5)	3.4 (3.3-3.5)	12.9 (12.7-13.0)	16.8 (16.7-17.0)	35.6 (35.4-35.8)	5.0 (4.9-5.1)
Random effects	24.7 (18.5-32.2)	2.7 (2.0-3.7)	10.6 (6.9-15.9)	5.4 (3.1-9.2)	48.1 (39.3-57.0)	4.7 (3.6-6.1)

Note: An inverse variance weighted meta-analysis of the proportions was conducted across regions to account for the differences between the sizes of the cohorts. As significant heterogeneity was observed, a random-effects meta-analysis was also conducted. Estimates from these meta-analyses are also provided. The random-effects meta-analyses estimates resulted in wide confidence intervals that reflect the level of heterogeneity. Nevertheless, the point estimates remained largely similar to the overall cohort estimates.

Table S2. Estimated proportions of children/adolescents still alive with suppressed HIV viral load (VL) <1000 copies/mL by years on ART, stratified by IeDEA region

Asia-Pacific	Year 1		Year 2		Year 3	
	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)
<i>Total with suppressed VL</i>	789 (636-833)	0.84 (0.68-0.89)	729 (577-755)	0.86 (0.68-0.89)	646 (507-663)	0.87 (0.68-0.89)
<i>Total with unsuppressed VL</i>	147		119		99	
<i>Total deaths (cumulative)</i>	11		17		18	
<i>Total with No VL</i>	429		357		245	
Estimated suppressed VL	362 (292-382)	0.84 (0.68-0.89)	307 (243-318)	0.86 (0.68-0.89)	212 (167-218)	0.87 (0.68-0.89)
<i>Total transfers (cumulative)</i>	45		94		146	
Estimated deaths	0 (0-4)	0.01 (0.01-0.09)	1 (1-9)	0.01 (0.01-0.09)	2 (2-14)	0.01 (0.01-0.09)
Estimated suppressed VL	38 (31-40)	0.84 (0.68-0.89)	80 (63-83)	0.86 (0.68-0.89)	125 (98-128)	0.87 (0.68-0.89)
<i>Total LTFU (cumulative)</i>	19		41		71	
Estimated with known status	14 (13-16)	0.75 (0.71-0.86)	31 (29-35)	0.75 (0.71-0.86)	53 (50-61)	0.75 (0.71-0.86)
Estimated death	3 (3-4)	0.21 (0.19-0.32)	7 (6-10)	0.21 (0.19-0.32)	11 (10-17)	0.21 (0.19-0.32)
Estimated re-connected to care (unofficial transfers)	6 (3-8)	0.55 (0.31-0.74)	13 (7-18)	0.55 (0.31-0.74)	23 (13-31)	0.55 (0.31-0.74)
Estimated suppressed VL among re-connected to care	3 (2-4)	0.51 (0.28-0.72)	7 (4-9)	0.51 (0.28-0.72)	12 (6-17)	0.51 (0.28-0.72)
Total estimated suppressed VL	1192 (961-1259)	0.84 (0.67-0.88)	1123 (887-1165)	0.84 (0.67-0.87)	995 (778-1026)	0.83 (0.65-0.86)
Total non-deaths	1426		1332		1194	

CCASAnet	Year 1		Year 2		Year 3	
	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)
<i>Total with suppressed VL</i>	143 (103-165)	0.79 (0.57-0.91)	112 (83-132)	0.77 (0.57-0.91)	86 (62-98)	0.80 (0.57-0.91)
<i>Total with unsuppressed VL</i>	38		33		22	
<i>Total deaths (cumulative)</i>	2		2		2	

Total with no VL	28		34		32	
Estimated suppressed VL	22 (16-25)	0.79 (0.57-0.91)	26 (19-31)	0.77 (0.57-0.91)	25 (18-29)	0.80 (0.57-0.91)
Total transfers (cumulative)	5		7		7	
Estimated deaths	0 (0-1)	0.01 (0.01-0.13)	0 (0-1)	0.0 (0.01-0.13)	0 (0-1)	0.0 (0.01-0.13)
Estimated suppressed VL	4 (3-5)	0.79 (0.57-0.91)	5 (4-6)	0.77 (0.57-0.91)	6 (4-6)	0.80 (0.57-0.91)
Total LTFU (cumulative)	29		48		75	
Estimated with known status	22 (21-25)	0.75 (0.71-0.86)	36 (34-41)	0.75 (0.71-0.86)	56 (53-65)	0.75 (0.71-0.86)
Estimated death	5 (4-7)	0.21 (0.19-0.32)	8 (7-12)	0.21 (0.19-0.32)	12 (11-18)	0.21 (0.19-0.32)
Estimated re-connected to care (unofficial transfers)	9 (5-13)	0.55 (0.31-0.74)	15 (9-21)	0.55 (0.31-0.74)	24 (14-33)	0.55 (0.31-0.74)
Estimated suppressed VL among re-connected to care	5 (3-6)	0.51 (0.28-0.72)	8 (4-11)	0.51 (0.28-0.72)	12 (7-17)	0.51 (0.28-0.72)
Total estimated suppressed VL	174 (125-201)	0.73 (0.53-0.84)	151 (110-180)	0.67 (0.49-0.80)	129 (91-150)	0.61 (0.43-0.71)
Total non-deaths	238		226		210	

Central Africa	Year 1		Year 2		Year 3	
	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)
Total with suppressed VL	72 (42-81)	0.82 (0.48-0.92)	40 (22-42)	0.87 (0.48-0.92)		
Total with unsuppressed VL	16		6			
Total deaths (cumulative)	1		1			
Total with no VL	14		9			
Estimated suppressed VL	11 (7-13)	0.82 (0.48-0.92)	8 (4-8)	0.87 (0.48-0.92)		
Total transfers (cumulative)	0		0			
Total LTFU (cumulative)	64		103			
Estimated with known status	48 (45-55)	0.75 (0.71-0.86)	77 (73-89)	0.75 (0.71-0.86)		
Estimated death	10 (9-15)	0.21 (0.19-0.32)	16 (15-25)	0.21 (0.19-0.32)		
Estimated re-connected to care (unofficial transfers)	21 (12-28)	0.55 (0.31-0.74)	34 (19-45)	0.55 (0.31-0.74)		
Estimated suppressed VL among re-connected to care	11 (6-15)	0.51 (0.28-0.72)	17 (10-24)	0.51 (0.28-0.72)		
Total estimated suppressed VL	94 (55-109)	0.60 (0.35-0.70)	65 (36-74)	0.46 (0.25-0.52)		

Total non-deaths		156			142		
	Year 1		Year 2		Year 3		
East Africa	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	
<i>Total with suppressed VL</i>	1995 (1292-2476)	0.74 (0.48-0.92)	1560 (1017-1949)	0.74 (0.48-0.92)	1146 (728-1395)	0.76 (0.48-0.92)	
<i>Total with unsuppressed VL</i>	696		558		370		
<i>Total deaths (cumulative)</i>	174		201		216		
<i>Total with No VL</i>	1257		721		308		
Estimated suppressed VL	932 (603-1156)	0.74 (0.48-0.92)	531 (346-663)	0.74 (0.48-0.92)	233 (148-283)	0.76 (0.48-0.92)	
<i>Total transfers (cumulative)</i>	270		419		518		
Estimated deaths	10 (10-46)	0.04 (0.04-0.17)	19 (17-72)	0.05 (0.04-0.17)	27 (21-89)	0.05 (0.04-0.17)	
Estimated suppressed VL	193 (125-239)	0.74 (0.48-0.92)	295 (192-368)	0.74 (0.48-0.92)	371 (236-452)	0.76 (0.48-0.92)	
<i>Total LTFU (cumulative)</i>	1041		1274		1380		
Estimated with known status	781 (739-895)	0.75 (0.71-0.86)	956 (905-1096)	0.75 (0.71-0.86)	1035 (980-1187)	0.75 (0.71-0.86)	
Estimated deaths	164 (148-250)	0.21 (0.19-0.32)	201 (182-306)	0.21 (0.19-0.32)	217 (197-331)	0.21 (0.19-0.32)	
Estimated re-connected to care (unofficial transfers)	339 (191-457)	0.55 (0.31-0.74)	415 (234-559)	0.55 (0.31-0.74)	450 (254-605)	0.55 (0.31-0.74)	
Estimated suppressed VL among re-connected to care	173 (95-244)	0.51 (0.28-0.72)	212 (116-299)	0.51 (0.28-0.72)	230 (126-324)	0.51 (0.28-0.72)	
Total estimated suppressed VL	3293 (2115-4115)	0.65 (0.42-0.81)	2598 (1671-3279)	0.60 (0.39-0.76)	1980 (1238-2454)	0.57 (0.36-0.71)	
Total non-deaths	5085		4312		3478		

	Year 1		Year 2		Year 3		
Southern Africa	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	
<i>Total with suppressed VL</i>	3489 (2378-4559)	0.72 (0.48-0.92)	2899 (1890-3623)	0.74 (0.48-0.92)	2163 (1387-2659)	0.75 (0.48-0.92)	
<i>Total with unsuppressed VL</i>	1466		1039		727		
<i>Total deaths (cumulative)</i>	263		287		300		
<i>Total with No VL</i>	2615		2123		1582		
Estimated suppressed VL	1894 (1255-2406)	0.72 (0.48-0.92)	1563 (1019-1953)	0.74 (0.48-0.92)	1184 (759-1455)	0.75 (0.48-0.92)	

Total transfers (cumulative)	1093		1780		2311	
Estimated deaths	34 (34-187)	0.03 (0.03-0.17)	72 (72-304)	0.04 (0.04-0.17)	114 (95-395)	0.05 (0.04-0.17)
Estimated suppressed VL	767 (508-974)	0.72 (0.48-0.92)	1257 (820-1571)	0.74 (0.48-0.92)	1644 (1055-2021)	0.75 (0.48-0.92)
Total LTFU (cumulative)	1858		2531		3071	
Estimated with known status	1394 (1319-1598)	0.75 (0.71-0.86)	1898 (1797-2177)	0.75 (0.71-0.86)	2303 (2180-2641)	0.75 (0.71-0.86)
Estimated deaths	293 (265-446)	0.21 (0.19-0.32)	399 (361-607)	0.21 (0.19-0.32)	484 (438-737)	0.21 (0.19-0.32)
Estimated re-connected to care (unofficial transfers)	606 (341-815)	0.55 (0.31-0.74)	824 (465-1109)	0.55 (0.31-0.74)	1000 (564-1346)	0.55 (0.31-0.74)
Estimated suppressed VL among re-connected to care	309 (170-436)	0.51 (0.28-0.72)	420 (231-593)	0.51 (0.28-0.72)	510 (280-720)	0.51 (0.28-0.72)
Total estimated suppressed VL	6459 (4311-8375)	0.63 (0.42-0.82)	6139 (3960-7740)	0.62 (0.40-0.78)	5501 (3481-6855)	0.59 (0.38-0.74)
Total non-deaths	10194		9901		9256	

West Africa	Year 1		Year 2		Year 3	
	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)
Total with suppressed VL	455 (332-636)	0.66 (0.48-0.92)	369 (266-510)	0.67 (0.48-0.92)	245 (182-350)	0.64 (0.48-0.92)
Total with unsuppressed VL	236		185		135	
Total deaths (cumulative)	181		191		198	
Total with No VL	333		231		151	
Estimated suppressed VL	219 (160-306)	0.66 (0.48-0.92)	154 (111-213)	0.67 (0.48-0.92)	97 (72-139)	0.64 (0.48-0.92)
Total transfers (cumulative)	52		72		94	
Estimated deaths	7 (2-9)	0.14 (0.04-0.17)	12 (3-12)	0.16 (0.04-0.17)	19 (4-19)	0.20 (0.04-0.20)
Estimated suppressed VL	30 (22-41)	0.66 (0.48-0.92)	40 (29-55)	0.67 (0.48-0.92)	48 (36-69)	0.64 (0.48-0.92)
Total LTFU (cumulative)	792		943		1095	
Estimated with known status	594 (562-681)	0.75 (0.71-0.86)	707 (670-811)	0.75 (0.71-0.86)	821 (777-942)	0.75 (0.71-0.86)
Estimated deaths	125 (113-190)	0.21 (0.19-0.32)	148 (134-226)	0.21 (0.19-0.32)	172 (156-263)	0.21 (0.19-0.32)
Estimated re-connected to care (unofficial transfers)	258 (145-347)	0.55 (0.31-0.74)	307 (173-414)	0.55 (0.31-0.74)	357 (201-480)	0.55 (0.31-0.74)
Estimated suppressed VL among re-connected to care	132 (72-186)	0.51 (0.28-0.72)	157 (86-221)	0.51 (0.28-0.72)	182 (100-257)	0.51 (0.28-0.72)

Total estimated suppressed VL	836 (586-1169)	0.48 (0.34-0.67)	720 (492-999)	0.44 (0.30-0.61)	572 (390-815)	0.37 (0.26-0.53)
Total non-deaths	1736		1640		1529	

Children, <18 years at ART initiation; ART, consists of the combination of at least three antiretrovirals.

Note: Plausible ranges of estimated suppressed VL among re-connected to care were extracted from 95% CI of the tracing study (24).

Abbreviations: IQR, Interquartile range; CCASAnet, Caribbean/Central and South America.

Table S3. Estimated proportions of adults still alive with suppressed HIV viral load (VL) <1000 copies/mL) by years on ART, stratified by IeDEA region

Asia-Pacific	Year 1		Year 2		Year 3	
	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)
<i>Total with suppressed VL</i>	981 (833-1000)	0.94 (0.80-0.96)	847 (697-847)	0.97 (0.80-0.97)	891 (734-891)	0.97 (0.80-0.97)
<i>Total with unsuppressed VL</i>	61		24		26	
<i>Total deaths (cumulative)</i>	65		78		90	
<i>Total with No VL</i>	861		772		541	
Estimated suppressed VL	809 (689-827)	0.94 (0.80-0.96)	749 (618-749)	0.97 (0.80-0.97)	525 (433-525)	0.97 (0.80-0.97)
<i>Total transfers (cumulative)</i>	45		63		85	
Estimated deaths	1 (1-3)	0.03 (0.03-0.06)	2 (2-4)	0.04 (0.04-0.06)	4 (3-5)	0.05 (0.04-0.06)
Estimated suppressed VL	41 (35-42)	0.94 (0.80-0.96)	59 (50-59)	0.97 (0.80-0.97)	79 (65-79)	0.97 (0.80-0.97)
<i>Total LTFU (cumulative)</i>	122		214		263	
Estimated with known status	92 (87-105)	0.75 (0.71-0.86)	161 (152-184)	0.75 (0.71-0.86)	197 (187-226)	0.75 (0.71-0.86)
Estimated deaths	19 (17-29)	0.21 (0.19-0.32)	34 (31-52)	0.21 (0.19-0.32)	41 (37-63)	0.21 (0.19-0.32)
Estimated re-connected to care (unofficial transfers)	40 (23-54)	0.55 (0.31-0.74)	70 (39-94)	0.55 (0.31-0.74)	86 (48-115)	0.55 (0.31-0.74)
Estimated suppressed VL among re-connected to care	20 (11-29)	0.51 (0.28-0.72)	36 (20-50)	0.51 (0.28-0.72)	44 (24-62)	0.51 (0.28-0.72)
Total estimated suppressed VL	1851 (1568-1898)	90% (77%-93%)	1691 (1385-1705)	90% (73%-90%)	1539 (1246-1557)	87% (71%-88%)
Total non-deaths	2050		1886		1761	

CCASAnet	Year 1		Year 2		Year 3	
	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)
<i>Total with suppressed VL</i>	6207 (3558-6295)	0.91 (0.52-0.92)	5064 (2919-5164)	0.90 (0.52-0.92)	3979 (2299-4067)	0.90 (0.52-0.92)
<i>Total with unsuppressed VL</i>	635		549		442	
<i>Total deaths (cumulative)</i>	289		352		399	
<i>Total with No VL</i>	1306		999		764	
Estimated suppressed VL	1188 (679-1201)	0.91 (0.52-0.92)	899 (519-919)	0.90 (0.52-0.92)	688 (397-703)	0.90 (0.52-0.92)

Total transfers (cumulative)	49		102		127	
Estimated deaths	1 (1-4)	0.03 (0.01-0.09)	4 (1-9)	0.04 (0.01-0.09)	6 (1-11)	0.05 (0.01-0.09)
Estimated suppressed VL	44 (25-45)	0.91 (0.52-0.92)	88 (51-90)	0.90 (0.52-0.92)	109 (63-113)	0.90 (0.52-0.92)
Total LTFU (cumulative)	1034		1663		2314	
Estimated with known status	776 (734-889)	0.75 (0.71-0.86)	1247 (1181-1430)	0.75 (0.71-0.86)	1736 (1643-1990)	0.75 (0.71-0.86)
Estimated deaths	163 (147-248)	0.21 (0.19-0.32)	262 (237-399)	0.21 (0.19-0.32)	365 (330-556)	0.21 (0.19-0.32)
Estimated re-connected to care (unofficial transfers)	337 (190-454)	0.55 (0.31-0.74)	542 (305-729)	0.55 (0.31-0.74)	754 (425-1015)	0.55 (0.31-0.74)
Estimated suppressed VL among re-connected to care	172 (94-243)	0.51 (0.28-0.72)	276 (152-390)	0.51 (0.28-0.72)	385 (211-543)	0.51 (0.28-0.72)
Total estimated suppressed VL	7611 (4356-7784)	84% (48%-86%)	6327 (3641-6563)	78% (45%-81%)	5161 (2970-5426)	71% (41%-75%)
Total non-deaths	9067		8111		7255	

NA-ACCORD	Year 1		Year 2		Year 3	
	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)
Total with suppressed VL	6899 (5735-6991)	0.88 (0.73-0.89)	5333 (4401-5366)	0.88 (0.73-0.89)	4248 (3474-4248)	0.89 (0.73-0.89)
Total with unsuppressed VL	957		696		511	
Total deaths (cumulative)	233		335		410	
Total with No VL	551		515		372	
Estimated suppressed VL	485 (402-490)	0.88 (0.73-0.89)	453 (376-458)	0.88 (0.73-0.89)	331 (272-331)	0.89 (0.73-0.89)
Total transfers (cumulative)	N/A		N/A		N/A	
Estimated deaths	N/A		N/A		N/A	
Estimated suppressed VL	N/A		N/A		N/A	
Total LTFU (cumulative)	1316		2003		2478	
Estimated with known status	987 (934-1132)	0.75 (0.71-0.86)	1502 (1422-1723)	0.75 (0.71-0.86)	1859 (1759-2131)	0.75 (0.71-0.86)
Estimated deaths	207 (188-316)	0.21 (0.19-0.32)	315 (285-481)	0.21 (0.19-0.32)	390 (353-595)	0.21 (0.19-0.32)
Estimated re-connected to care (unofficial transfers)	429 (242-577)	0.55 (0.31-0.74)	653 (368-878)	0.55 (0.31-0.74)	808 (455-1087)	0.55 (0.31-0.74)
Estimated suppressed VL among re-connected to care	219 (120-309)	0.51 (0.28-0.72)	333 (183-470)	0.51 (0.28-0.72)	412 (226-582)	0.51 (0.28-0.72)
Total estimated suppressed VL	7603 (6257-7790)	80% (66%-82%)	6119 (4960-6294)	74% (60%-76%)	4991 (3972-5161)	69% (55%-71%)

Total non-deaths	9516		8232		7219	
Central Africa	Year 1		Year 2		Year 3	
	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)
<i>Total with suppressed VL</i>	<i>1014</i> (665-1075)	0.91 (0.60-0.97)	<i>504</i> (322-521)	0.94 (0.60-0.97)	<i>19</i> (12-19)	0.95 (0.60-0.97)
<i>Total with unsuppressed VL</i>	<i>95</i>		<i>33</i>		<i>1</i>	
<i>Total deaths (cumulative)</i>	<i>29</i>		<i>36</i>		<i>37</i>	
<i>Total with No VL</i>	<i>192</i>		<i>62</i>		<i>0</i>	
Estimated suppressed VL	175 (115-186)	0.91 (0.60-0.97)	58 (37-60)	0.94 (0.60-0.97)	0	0.95 (0.60-0.97)
<i>Total transfers (cumulative)</i>	<i>N/A</i>		<i>N/A</i>		<i>N/A</i>	
Estimated deaths	N/A		N/A		N/A	
Estimated suppressed VL	N/A	0.91 (0.60-0.97)	N/A	0.94 (0.60-0.97)	N/A	0.95 (0.60-0.97)
<i>Total LTFU (cumulative)</i>	<i>1104</i>		<i>1593</i>		<i>1924</i>	
Estimated with known status	828 (784-949)	0.75 (0.71-0.86)	1195 (1131-1370)	0.75 (0.71-0.86)	1443 (1366-1655)	0.75 (0.71-0.86)
Estimated deaths	174 (157-265)	0.21 (0.19-0.32)	251 (227-382)	0.21 (0.19-0.32)	303 (274-462)	0.21 (0.19-0.32)
Estimated re-connected to care (unofficial transfers)	360 (203-484)	0.55 (0.31-0.74)	519 (293-699)	0.55 (0.31-0.74)	627 (353-844)	0.55 (0.31-0.74)
Estimated suppressed VL among re-connected to care	184 (101-259)	0.51 (0.28-0.72)	265 (145-374)	0.51 (0.28-0.72)	320 (176-451)	0.51 (0.28-0.72)
Total estimated suppressed VL	1373 (871-1520)	62% (39%-68%)	807 (504-955)	42% (26%-49%)	339 (188-470)	21% (11%-29%)
Total non-deaths	2231		1941		1641	

East Africa	Year 1		Year 2		Year 3	
	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)
<i>Total with suppressed VL</i>	<i>23,928</i> (16,023-25,905)	0.90 (0.60-0.97)	<i>17,269</i> (11,451-18,512)	0.90 (0.60-0.97)	<i>10,979</i> (7233-11,693)	0.91 (0.60-0.97)
<i>Total with unsuppressed VL</i>	<i>2778</i>		<i>1816</i>		<i>1076</i>	
<i>Total deaths (cumulative)</i>	<i>2282</i>		<i>2612</i>		<i>2770</i>	
<i>Total with No VL</i>	<i>10,870</i>		<i>6199</i>		<i>2507</i>	

Estimated suppressed VL	9783 (6522-10,544)	0.90 (0.60-0.97)	5579 (3719-6013)	0.90 (0.60-0.97)	2281 (1504-2432)	0.91 (0.60-0.97)
Total transfers (cumulative)	2351		3438		4044	
Estimated deaths	117 (25-456)	0.05 (0.01-0.18)	208 (34-619)	0.06 (0.01-0.18)	283 (40-728)	0.07 (0.01-0.18)
Estimated suppressed VL	2011 (1340-2167)	0.90 (0.60-0.97)	2907 (1938-3133)	0.90 (0.60-0.97)	3422 (2257-3648)	0.91 (0.60-0.97)
Total LTFU (cumulative)	12,646		15,596		16,988	
Estimated with known status	9485 (8979-10,876)	0.75 (0.71-0.86)	11,697 (11,073-13,413)	0.75 (0.71-0.86)	12,741 (12,061-14,610)	0.75 (0.71-0.86)
Estimated deaths	1931 (472-4668)	0.21 (0.19-0.32)	2361 (577-5705)	0.21 (0.19-0.32)	2512 (614-6071)	0.21 (0.19-0.32)
Estimated re-connected to care (unofficial transfers)	4121 (2323-5545)	0.55 (0.31-0.74)	5083 (2865-6838)	0.55 (0.31-0.74)	5536 (3120-7448)	0.55 (0.31-0.74)
Estimated suppressed VL among re-connected to care	2102 (1154-2967)	0.51 (0.28-0.72)	2592 (1423-3660)	0.51 (0.28-0.72)	2823 (1550-3986)	0.51 (0.28-0.72)
Total estimated suppressed VL	37,824 (25,039-41,583)	75% (50%-82%)	30,354 (20,158-32,589)	73% (48%-78%)	19,505 (12,544-21,759)	59% (38%-66%)
Total non-deaths	50,525		41,749		32,799	

Southern Africa

	Year 1		Year 2		Year 3	
	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)
Total with suppressed VL	65,908 (44,634-72,158)	0.89 (0.60-0.97)	48,984 (33,046-53,425)	0.89 (0.60-0.97)	37,233 (24,977-36,116)	0.90 (0.60-0.97)
Total with unsuppressed VL	8482		6093		4395	
Total deaths (cumulative)	4128		5053		5648	
Total with No VL	35,298		27,853		19,765	
Estimated suppressed VL	31,415 (21,179-34,239)	0.89 (0.60-0.97)	24,789 (16,712-27,017)	0.89 (0.60-0.97)	17,788 (11,859-19,172)	0.90 (0.60-0.97)
Total transfers (cumulative)	14,174		20,968		25,732	
Estimated deaths	425 (142-2551)	0.03 (0.01-0.18)	1048 (210-3774)	0.05 (0.01-0.18)	1544 (257-4632)	0.06 (0.01-0.18)
Estimated suppressed VL	12,237 (8249-13,336)	0.89 (0.60-0.97)	17,729 (11,952-19,322)	0.89 (0.60-0.97)	19,339 (12,893-20,843)	0.90 (0.60-0.97)
Total LTFU (cumulative)	28,223		37,850		44,956	
Estimated with known status	21,167 (20,038-24,272)	0.75 (0.71-0.86)	28,388 (26,874-32,551)	0.75 (0.71-0.86)	33,717 (31,919-38,662)	0.75 (0.71-0.86)
Estimated deaths	4445 (4022-6773)	0.21 (0.19-0.32)	5961 (5394-9084)	0.21 (0.19-0.32)	7081 (6406-10,789)	0.21 (0.19-0.32)
Estimated re-connected to care (unofficial transfers)	9197 (5184-12,374)	0.55 (0.31-0.74)	12,335 (6952-16,596)	0.55 (0.31-0.74)	14,650 (8257-19,711)	0.55 (0.31-0.74)

Estimated suppressed VL among re-connected to care	4690 (2575-6622)	0.51 (0.28-0.72)	6291 (3454-8881)	0.51 (0.28-0.72)	7472 (4102-10,548)	0.51 (0.28-0.72)
Total estimated suppressed VL	117,708 (79,580-116,654)	78% (52%-86%)	97,793 (65,164-10,8645)	73% (48%-81%)	81,832 (53,831-86,679)	66% (44%-70%)
Total non-deaths	147,215		134,739		123,456	

West Africa	Year 1		Year 2		Year 3	
	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)	Total (plausible ranges)	Proportions (plausible ranges)
<i>Total with suppressed VL</i>	<i>1604 (1052-1701)</i>	<i>0.91 (0.60-0.97)</i>	<i>1140 (751-1213)</i>	<i>0.91 (0.60-0.97)</i>	<i>721 (472-763)</i>	<i>0.92 (0.60-0.97)</i>
<i>Total with unsuppressed VL</i>	<i>150</i>		<i>111</i>		<i>66</i>	
<i>Total deaths (cumulative)</i>	<i>304</i>		<i>320</i>		<i>327</i>	
<i>Total with No VL</i>	<i>1049</i>		<i>842</i>		<i>540</i>	
Estimated suppressed VL	944 (629-1017)	0.90 (0.60-0.97)	758 (505-817)	0.90 (0.60-0.97)	491 (324-524)	0.91 (0.60-0.97)
<i>Total transfers (cumulative)</i>	<i>76</i>		<i>114</i>		<i>142</i>	
Estimated deaths	6 (1-14)	0.08 (0.01-0.18)	11 (1-20)	0.10 (0.01-0.18)	18 (1-26)	0.13 (0.01-0.18)
Estimated suppressed VL	63 (42-68)	0.90 (0.60-0.97)	93 (62-100)	0.90 (0.60-0.97)	113 (74-120)	0.91 (0.60-0.97)
<i>Total LTFU (cumulative)</i>	<i>2304</i>		<i>2830</i>		<i>3414</i>	
Estimated with known status	1728 (1636-1981)	0.75 (0.71-0.86)	2123 (2009-2434)	0.75 (0.71-0.86)	2561 (2424-2936)	0.75 (0.71-0.86)
Estimated deaths	363 (328-553)	0.21 (0.19-0.32)	446 (403-679)	0.21 (0.19-0.32)	538 (487-820)	0.21 (0.19-0.32)
Estimated re-connected to care (unofficial transfers)	751 (423-1010)	0.55 (0.31-0.74)	922 (520-1241)	0.55 (0.31-0.74)	1113 (627-1497)	0.55 (0.31-0.74)
Estimated suppressed VL among re-connected to care	383 (210-541)	0.51 (0.28-0.72)	470 (258-664)	0.51 (0.28-0.72)	568 (312-801)	0.51 (0.28-0.72)
Total estimated suppressed VL	2994 (1933-3327)	62% (40%-69%)	2461 (1576-2794)	54% (34%-61%)	1893 (1182-2208)	44% (27%-51%)
Total non-deaths	4814		4580		4327	

Adults, ≥18 years at ART initiation; ART, consists of the combination of at least three antiretrovirals.

Note: Plausible ranges of estimated suppressed VL among re-connected to care were extracted from 95% CI of the tracing study (24).

Abbreviations: IQR, Interquartile range, CCASAnet, Caribbean/Central and South America; NA-ACCORD, The North American AIDS Cohort Collaboration on Research and Design

Table S4. Comparison of proportions of viral suppression (ITT, among VL measurement and adjusted), LTFU, transfer, mortality and without VL among children/adolescents

Year 1 (Children/Adolescents)	VL <1000 copies/mL (ITT)	VL <1000 copies/mL (Among PWH with VL measurements)	VL <1000 copies/mL (Adjusted)	% LTFU	% Transfer	% Mortality	% Without VL testing
Asia-Pacific	55%	84%	84%	1.3%	3.1%	0.8%	29.8%
CCASAnet	58%	79%	73%	11.8%	2.0%	0.8%	11.4%
Central Africa	43%	82%	60%	38.3%	0.0%	0.6%	8.4%
East Africa	37%	74%	65%	19.2%	5.0%	3.2%	23.1%
Southern Africa	35%	72%	63%	16.7%	9.8%	2.4%	23.5%
West Africa	22%	66%	48%	38.7%	2.5%	8.8%	16.3%
Overall	36%	74%	64%	18.6%	7.2%	3.1%	22.8%
Year 2 (Children/Adolescents)	VL <1000 copies/mL (ITT)	VL <1000 copies/mL (Among PWH with VL measurements)	VL <1000 copies/mL (Adjusted)	% LTFU	% Transfer	% Mortality	% Without VL testing
Asia-Pacific	54%	86%	84%	3.0%	6.9%	1.3%	26.3%
CCASAnet	47%	77%	67%	20.3%	3.0%	0.8%	14.4%
Central Africa	25%	87%	46%	64.8%	0.0%	0.6%	5.7%
East Africa	33%	74%	60%	26.9%	8.9%	4.2%	15.2%
Southern Africa	27%	74%	62%	23.7%	16.7%	2.7%	19.9%
West Africa	19%	67%	44%	47.4%	3.6%	9.6%	11.6%
Overall	30%	75%	62%	25.8%	12.4%	3.7%	18.2%
Year 3 (Children/Adolescents)	VL <1000 copies/mL (ITT)	VL <1000 copies/mL (Among PWH with VL measurements)	VL <1000 copies/mL (Adjusted)	% LTFU	% Transfer	% Mortality	% Without VL testing
Asia-Pacific	53%	87%	83%	5.8%	11.9%	1.5%	20.0%
CCASAnet	38%	80%	61%	33.5%	3.1%	0.9%	14.3%
Central Africa	0%	0%	0%	NA	NA	NA	NA
East Africa	29%	76%	57%	35.0%	13.2%	5.5%	7.8%
Southern Africa	21%	75%	59%	30.2%	22.8%	3.0%	15.6%
West Africa	13%	64%	37%	57.1%	4.9%	10.3%	7.9%
Overall	24%	76%	59%	33.1%	17.5%	4.2%	13.2%

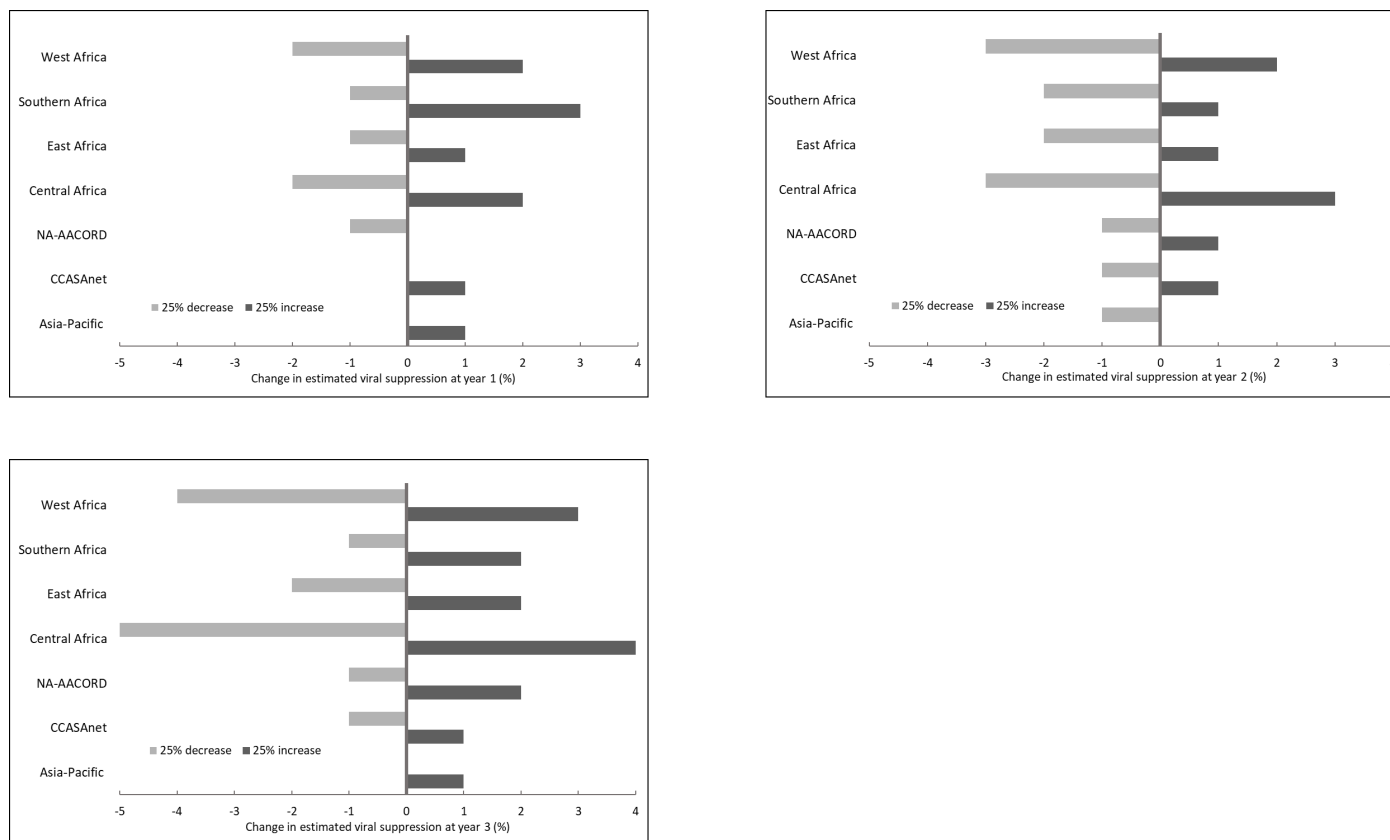
Table S5. Comparison of proportions of viral suppression (ITT, among VL measurement and adjusted), LTFU, transfer, mortality and without VL among adults

Year 1 (Adults)	VL <1000 copies/mL (ITT)	VL <1000 copies/mL (Among PWH with VL measurements)	VL <1000 copies/mL (Adjusted)	% LTFU	% Transfer	% Mortality	% Without VL testing
Asia-Pacific	46%	94%	90%	5.7%	2.1%	3.0%	40.3%
CCASAnet	65%	91%	84%	10.9%	0.5%	3.0%	13.7%
NA-ACCORD	69%	88%	80%	13.2%	0.0%	2.3%	5.5%
Central Africa	42%	91%	62%	45.3%	0.0%	1.2%	7.9%
East Africa	44%	90%	75%	23.0%	4.3%	4.2%	19.8%
Southern Africa	42%	88%	78%	18.1%	9.1%	2.6%	22.6%
West Africa	29%	91%	62%	42.0%	1.4%	5.5%	19.1%
Overall	44%	89%	79%	19.4%	6.9%	3.0%	20.8%
Year 2 (Adults)	VL <1000 copies/mL (ITT)	VL <1000 copies/mL (Among PWH with VL measurements)	VL <1000 copies/mL (Adjusted)	% LTFU	% Transfer	% Mortality	% Without VL testing
Asia-Pacific	42%	97%	90%	10.7%	3.2%	3.9%	38.6%
CCASAnet	58%	90%	78%	19.1%	1.2%	4.0%	11.4%
NA-ACCORD	60%	88%	74%	22.6%	0.0%	3.8%	5.8%
Central Africa	23%	94%	42%	71.0%	0.0%	1.6%	2.8%
East Africa	37%	90%	68%	33.2%	7.3%	5.6%	13.2%
Southern Africa	33%	89%	73%	25.8%	14.3%	3.4%	19.0%
West Africa	21%	91%	54%	52.8%	2.1%	6.0%	15.7%
Overall	36%	89%	72%	27.9%	11.2%	4.0%	16.9%
Year 3 (Adults)	VL <1000 copies/mL (ITT)	VL <1000 copies/mL (Among PWH with VL measurements)	VL <1000 copies/mL (Adjusted)	% LTFU	% Transfer	% Mortality	% Without VL testing
Asia-Pacific	47%	97%	87%	13.9%	4.5%	4.7%	28.5%
CCASAnet	50%	90%	71%	28.8%	1.6%	5.0%	9.5%
NA-ACCORD	52%	89%	69%	31.3%	0.0%	5.2%	4.7%
Central Africa	NA	NA	NA	NA	NA	NA	NA

East Africa	29%	91%	59%	44.3%	10.5%	7.2%	6.5%
Southern Africa	27%	89%	66%	32.6%	18.7%	4.1%	14.3%
West Africa	14%	92%	44%	65.5%	2.7%	6.3%	10.4%
Overall	29%	90%	65%	36.0%	15.0%	4.8%	12.2%

Figure S1. Sensitivity analysis of the overall viral suppression of adults by varying $\pm 25\%$ in the estimated viral suppression among those LTFU who reconnected to care

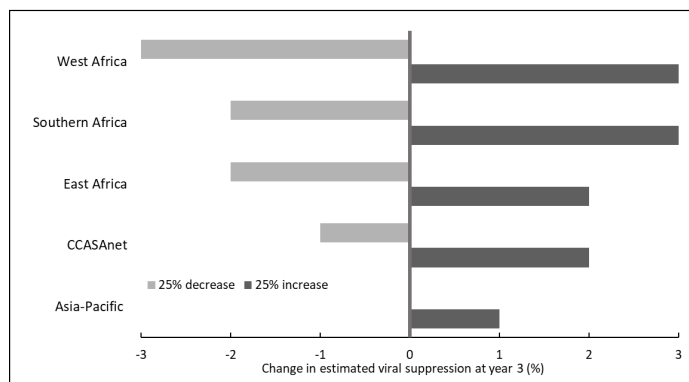
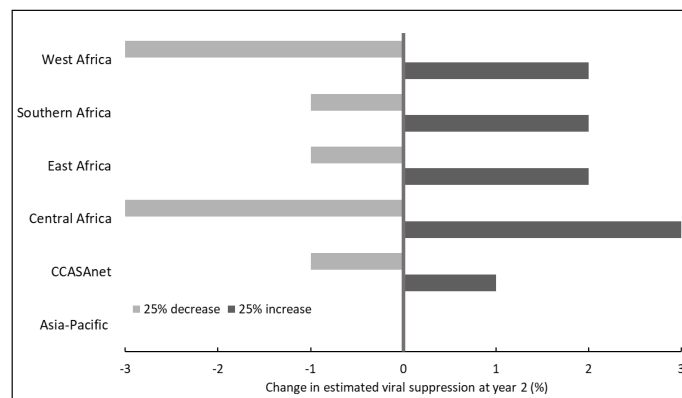
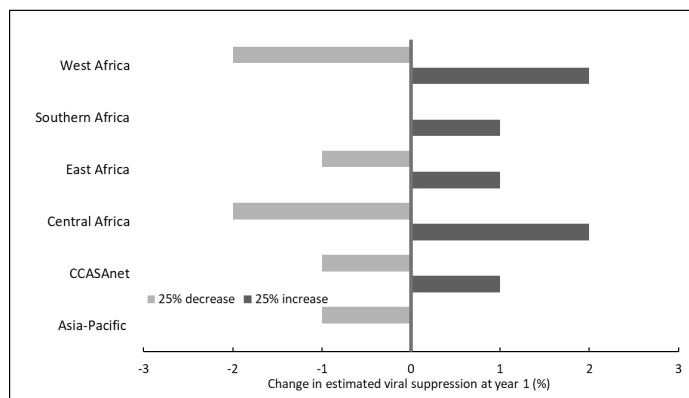
Children/adolescents



The estimated proportion of viral suppression among those who reconnected to care was 0.51 in the main adjusted analysis in children/adolescents. In the sensitivity analysis provided in the figure above, the upper bound (high) and lower bound (low) for the viral suppression proportions were applied as a 25% increase and decrease, respectively. For example, at year 3 after ART initiation, a 25% increase and a 25% decrease from the estimate used in the main analysis for viral suppression proportion among PWH reconnected to care for LTFU adults for Southern Africa would respectively result in a 2% increase and a 1% decrease in overall viral suppression estimates in the region.

Figure S2. Sensitivity analysis of the overall viral suppression of adults by varying $\pm 25\%$ in the estimated viral suppression among those LTFU who reconnected to care

Adults



The estimated viral suppression proportion among those who reconnected to care was estimated as 0.51 in the main adjusted analysis in adults. In the sensitivity analysis provided in the figure above, the upper bound (high) and lower bound (low) for the viral suppression proportion were applied as a 25% increase and decrease, respectively. For example, at year 3 after ART initiation, a 25% increase and 25% decrease from the estimate used in the main analysis for viral suppression proportions among PWH reconnected to care for LTFU adults for Southern Africa would result in a 3% increase and 2% decrease in overall viral suppression estimates in the region.

Figure S3. HIV viral suppression and treatment outcomes for children/adolescents with HIV in the IeDEA global consortium by region at years 1, 2, and 3 following ART initiation

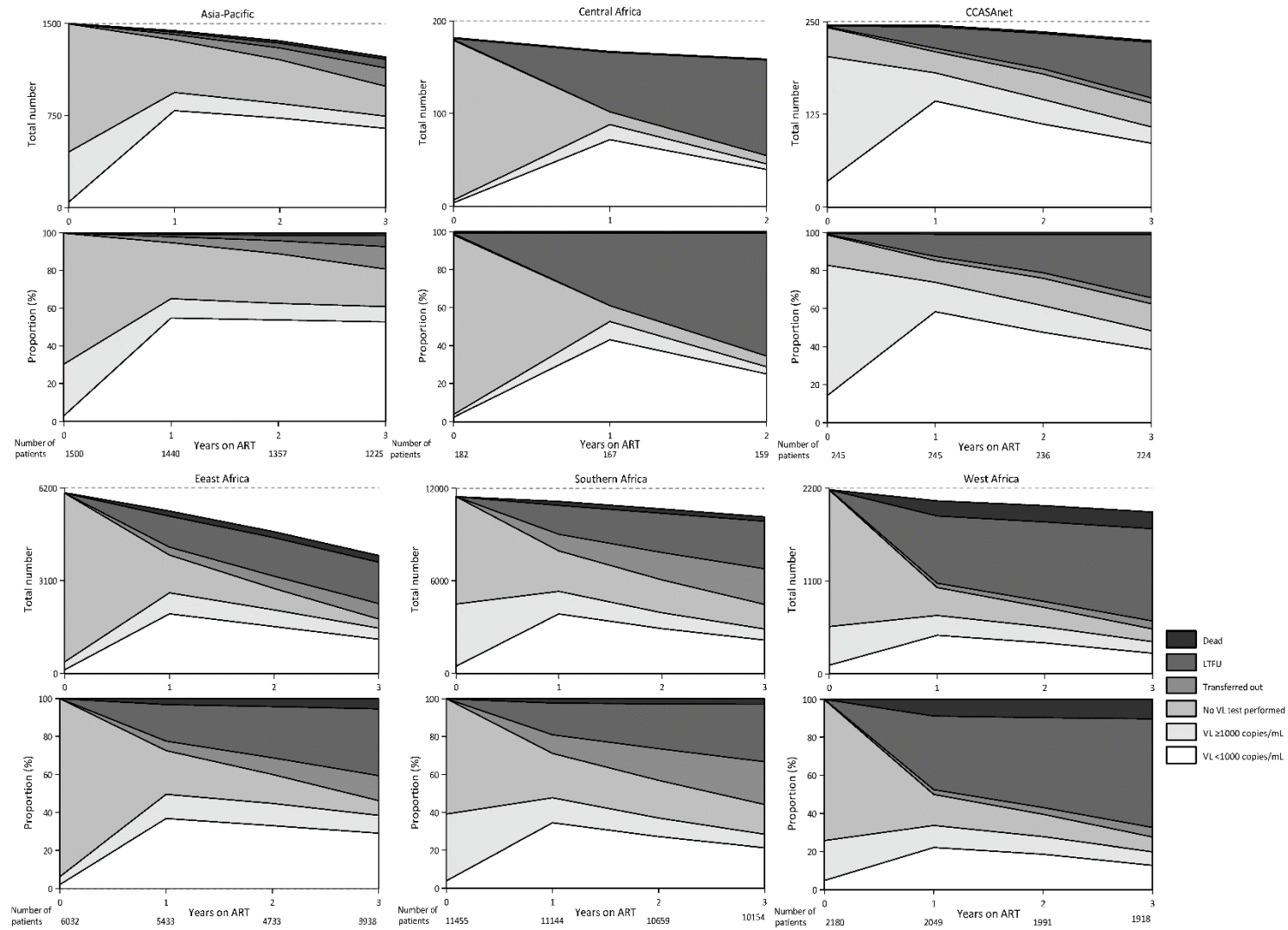
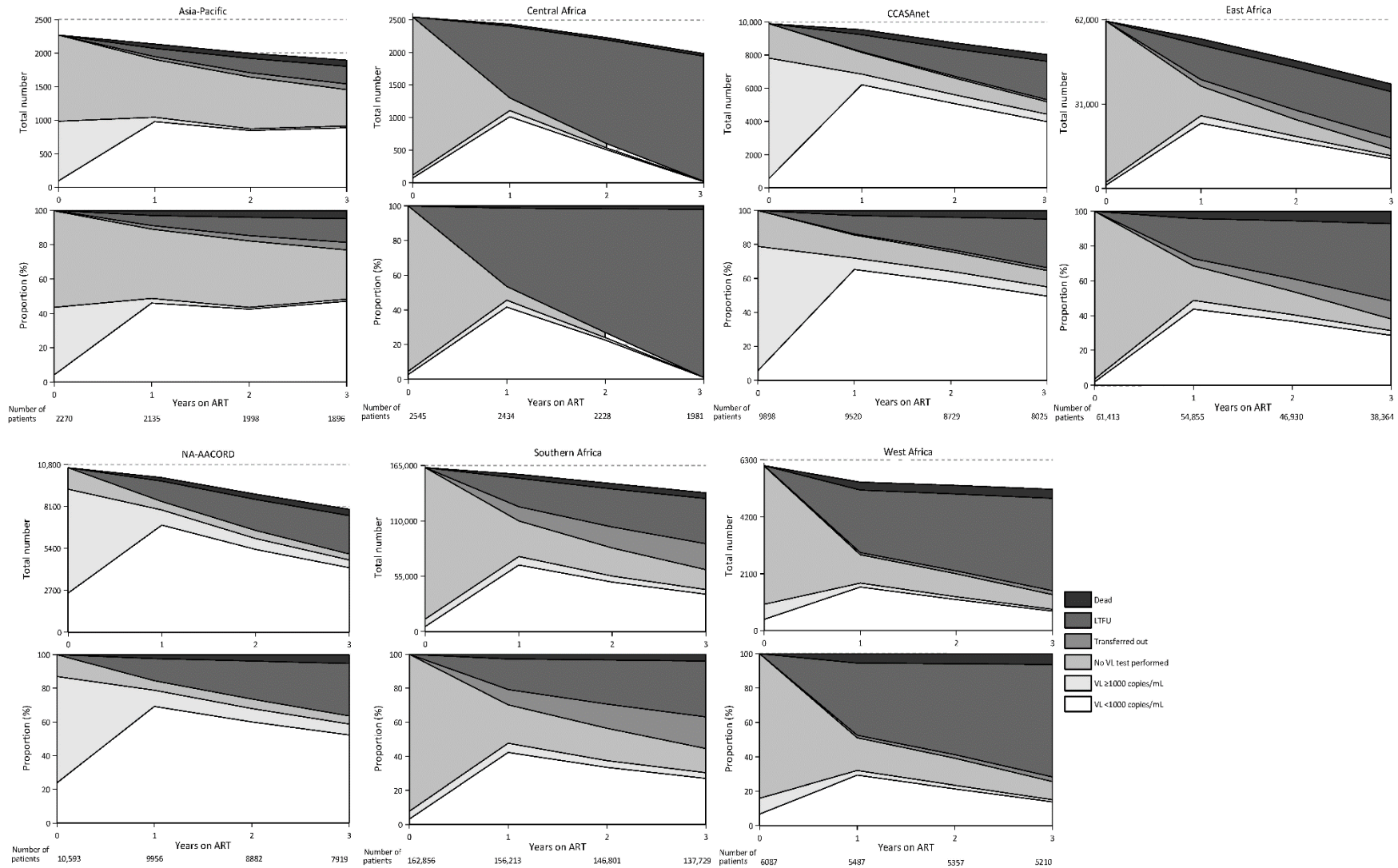


Figure S4. HIV viral suppression and treatment outcomes for adults with HIV in the IeDEA global consortium by region at years 1, 2, and 3 following ART initiation



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APPENDIX

IeDEA GLOBAL INVESTIGATOR ACKNOWLEDGEMENTS BY REGION

Asia-Pacific

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CCASAnet

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