Supplemental Digital Content: Table 1: Baseline Characteristics by age group

Characteristics		<3 months*	3 to <6 months*	6 to <12 months*
n (% of total cohort)		752 (15.2%)	1744 (35.3%)	2449 (49.5%)
Age (months), median (IQR)		2.2 (1.7; 2.7)	4.3 (3.6; 5;1)	8.8 (7.3; 10.2)
Female, n (%)		410 (54.5%)	927 (53.2%)	1209 (49.4%)
WHO stage 3 or 4, n (%)		484 (75.3%)	1150 (74.7%)	1693 (78.2%)
Absolute CD4, median (IQR)		873 (346; 1654)	737 (295; 1355)	765 (383; 1264)
CD4 Percentage, median (IQR)		22.2 (14.1; 32.5)	19 (12.3; 26.9)	17.2 (11.5; 23.5)
Severe Immunosuppression (WHO 2006), n (%)		396 (77.7%)	1073 (86.1%)	1594 (90.7%)
Viral Load ≥1 000 000, n (%)		175 (48.1%)	432 (52.8%)	405 (47.2%)
Severe Anaemia (DAIDS 2009), n (%)		54 (12.4%)	66 (6.6%)	128 (9.3%)
WAZ, median (IQR)		-2.8 (-4.02; -1.45)	- 2.5 (-4.0; -1.1)	-2.5 (-3.9; -1.2)
WAZ category, n (%)	WAZ > -2	182 (36.6%)	548 (41.3%)	793 (40.2%)
	WAZ ≤ -2 to > -3	100 (20.1%)	235 (17.7%)	351 (17.8%)
	WAZ ≤ -3	216 (43.4%)	543 (40.9%)	827 (41.9%)
HAZ, median (IQR)		- 2.4 (-4.0; -1.1)	- 2.4 (-3.8; -0.9)	- 2.6 (-3.9; -1.3)
HAZ category, n (%)	HAZ > -2	167 (40.6%)	449 (43.2%)	561 (38.2%)
	HAZ ≤ -2 to > -3	72 (17.5%)	183 (17.6%)	283 (19.3%)
	HAZ ≤ -3	172 (41.9%)	407 (39.2%)	625 (42.6%)
First Line Regimen, n (%)	D4T + 3TC + lopinavir/ritonavir	310 (43.8%)	803 (48.6%)	955 (41.5%)
	D4T + 3TC + nevirapine	63 (8.90%)	266 (16.1%)	642 (27.9%)
	ABC + 3TC + lopinavir/ritonavir	150 (21.2%)	257 (15.6%)	191 (8.3%)
	AZT + 3TC + nevirapine	41 (5.8%)	83 (5.0%)	219 (9.5%)
	AZT + 3TC + lopinavir/ritonavir	98 (13.9%)	102 (6.2%)	86 (3.7%)
	Other	46 (6.5%)	137 (8.3%)	204(8.9%)
3rd ART drug, n(%)	lopinavir/ritonavir	558 (78.8%)	1164 (70.5%)	1235 (53.7%)
	ritonavir	34 (4.8%)	88 (5.3%)	92 (4.0%)
	nevirapine	109 (15.4%)	377 (22.8%)	913 (39.7%)
	efavirenz	7 (1.0%)	22 (1.3%)	60 (2.6%)
PMTCT exposed, n (%)		218 (56.6%)	375 (56.4%)	355 (60.5%)

n: number with characteristic, ART: Antiretroviral therapy, IQR: Interquartile range, WHO: World Health Organisation, DAIDS: Division of AIDS, WAZ: Weight-for-age z-score, HAZ: Height-for-age z-score, PMTCT: Prevention of mother-to-child transmission of HIV, D4T: stavudine, 3TC:lamivudine, ABC: abacavir, AZT: zidovudine
*Figures calculated from non-missing observations within each age group

Supplemental Digital Content: Table 2: Estimates from Survival Analysis for the outcome of mortality (including imputed data and complete case analysis)

Survival Analysis Estimates for outcome of mortality: Cox Regression stratified by cohort n=4945																	
		Imputed Data									Complete Data						
		Univariate			Multivariate*			Model Selection ¥			Univariate			Multivariate* (n= 2132)		
Variable		HR	P value	95% CI	HR	P value	95% CI	HR	95% CI	VI	HR	P value	95% CI	HR	P value	95% CI
Female gender		0.97	0.716	0.83-1.14	-	-	-	-	-	0.31	0.97	0.716	0.82-1.14	-	-	-
Age at Initiation	0-2 months	reference			reference			reference			reference			reference		
	3-5 months	0.90	0.417	0.71-1.15	0.87	0.268	0.68-1.11	-	-	0.22	0.90	0.417	0.71-1.15	0.92	0.619	0.66-1.29
	6-11 months	0.98	0.898	0.78-1.25	0.84	0.161	0.66-1.07	-	-	-	0.98	0.898	0.78-1.25	0.82	0.268	0.57-1.17
Severe Immune suppression (WHO 2006)		2.51	0.000	1.66-3.79	2.19	0.000	1.44-3.33	2.15	1.42-3.27	1	2.61	0.000	1.73-3.95	2.13	0.002	1.33-3.40
WHO stage 3 or 4		1.89	0.000	1.47-2.45	1.36	0.023	1.04-1.78	1.35	1.04-1.77	0.87	1.91	0.000	1.49-2.44	1.39	0.040	1.02-1.90
Severe Anaemia (DAIDS 2009)		1.57	0.003	1.18-2.10	1.34	0.062	0.98-1.82	1.29	0.82-2.05	0.79	1.56	0.003	1.17-2.10	1.37	0.070	0.97-1.92
WAZ Category	> -2	reference			reference			reference			reference			reference		
	-2 to -3	1.40	0.015	1.07-1.84	1.29	0.063	0.99-1.71	1.29	0.99-1.71	1	1.46	0.009	1.09-1.93	1.68	0.003	1.19-2.36
	< -3	2.55	0.000	2.04-3.19	2.23	0.000	1.78-2.80	2.22	1.78-2.79	-	2.55	0.000	2.06-3.15	2.44	0.000	1.85-3.22
ART Initiated from the strat of 2010		0.65	0.000	0.52-0.83	0.75	0.015	0.59-0.94	0.75	0.59-0.95	0.88	0.65	0.000	0.52-0.83	0.80	0.161	0.59-1.09
**Viral Load ≥ 1 million copies/ml		1.30	0.045	1.01-1.68	1.17	0.267	0.88-1.56	1.14	0.79-1.62	0.56	1.37	0.019	1.05-1.79	1.39	0.068	0.98-1.98

WHO: World Health Organisation, DAIDS: Division of AIDS, WAZ: Weight-for-age z-score, ART: Antiretroviral therapy, HR: Hazard Ratio, CI: Confidence Interval, VI: Variable Importance

*Adjusted for age, WAZ category, severe immunosuppression, WHO stage 3 or 4, severe anaemia and initiation from the start of 2010 onwards

¥ Using AIC and model averaging

**Modelled separately on a subset of infants from South African cohorts (n=3473), adjusted for variables as above

Supplemental Digital Content: Table 3: Estimates from Survival Analysis (including imputed and complete case analysis) for the outcomes of virological suppression in a subset of infants from South African cohorts with a minimum of a baseline and one other virological measure
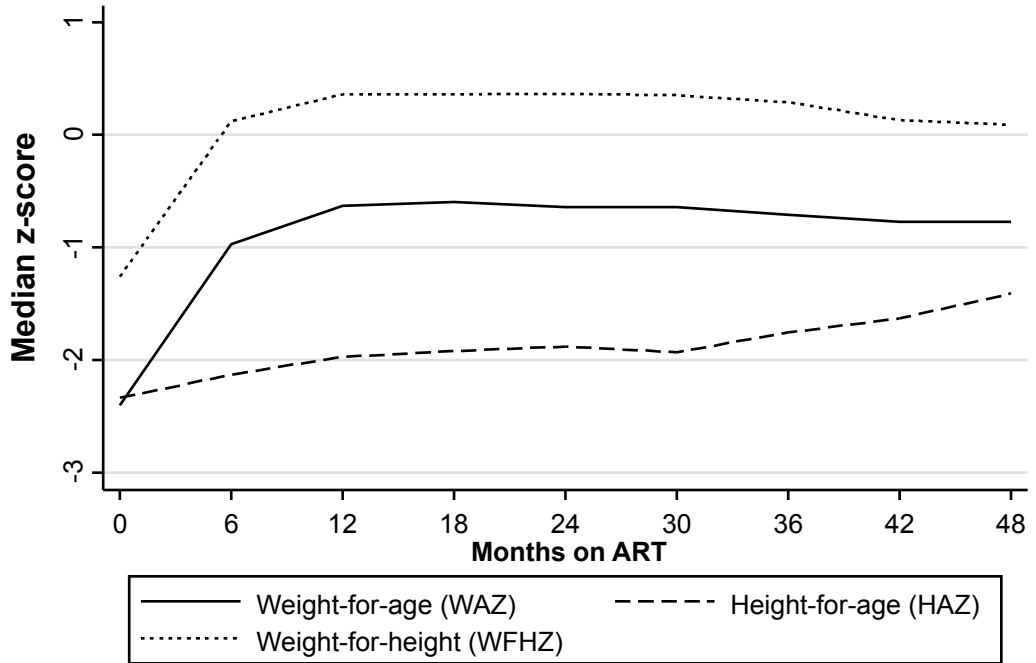
Survival Analysis looking at South African cohort and the association of viral load with time to virological suppression: Cox Regression stratified by cohort n=1364												
		Imputed Data						Complete Data					
		Univariate			Multivariate*			Univariate			Multivariate* (n=773)		
Variable		HR	P value	95% CI	HR	P value	95% CI	HR	P value	95% CI	HR	P value	95% CI
Female gender		1.01	0.877	0.88-1.15	-	-	-	1.01	0.880	0.88-1.15	-	-	-
Age at Initiation	0-2 months	reference			reference			reference			reference		
	3-5 months	0.82	0.053	0.67-1.02	0.87	0.165	0.71-1.06	0.82	0.053	0.67-1.00	0.83	0.150	0.64-1.07
	6-11 months	0.87	0.170	0.71-1.06	0.91	0.382	0.75-1.12	0.87	0.170	0.71-1.06	0.89	0.418	0.68-1.18
Severe Immune suppression (WHO 2006)		0.88	0.236	0.72-1.08	0.97	0.793	0.79-1.19	0.88	0.214	0.72-1.08	0.99	0.976	0.76-1.30
WHO stage 3 or 4		0.78	0.011	0.64-0.94	0.84	0.105	0.69-1.04	0.77	0.013	0.63-0.95	0.71	0.010	00.55-0.92
Severe Anaemia (DAIDS 2009)		1.14	0.384	0.84-1.56	1.17	0.312	0.86-1.59	1.21	0.205	0.90-1.62	1.07	0.689	0.76-1.51
Viral Load ≥ 1 million copies/ml		0.76	0.000	0.67-0.87	0.78	0.001	0.68-0.89	0.76	0.000	0.67-0.87	0.81	0.025	0.67-0.97
WAZ Category	> -2	reference			reference			reference			reference		
	-2 to -3	0.85	0.126	0.69-1.05	0.88	0.233	0.71-1.09	0.94	0.611	0.74-1.19	1.01	0.956	0.73-1.39
	< -3	0.85	0.067	0.72-1.01	0.90	0.283	0.75-1.09	0.87	0.133	0.72-1.04	0.86	0.232	0.66-1.10
ART Initiated from the start of 2010		1.23	0.044	1.01-1.49	1.16	0.167	0.94-1.42	1.23	0.044	1.01-1.49	1.09	0.483	0.84-1.43

WHO: World Health Organisation, DAIDS: Division of AIDS, WAZ: Weight-for-age z-score, ART: Antiretroviral therapy, HR: Hazard Ratio, CI: Confidence Interval, VI: Variable Importance

*Adjusted for age, WAZ category, severe immunosuppression, WHO stage 3 or 4, severe anaemia, viral load category and initiation from the start of 2010 onwards

¥ Using AIC and model averaging

Median anthropometric z-scores over time

Legend:
- Weight-for-age (WAZ) — solid line
- Height-for-age (HAZ) — dashed line
- Weight-for-height (WFHZ) — dotted line

Months on ART	0	6	12	18	24	30	36	42	48
Weight-for-age									
n	1775	1920	1871	1572	1252	984	791	603	465
Median	-2.40	-0.97	-0.63	-0.59	-0.64	-0.64	-0.71	-0.77	-0.77
IQR	-3.85;-1.02	-2.06;0.01	-1.55;0.29	-1.53;0.27	-1.51;0.16	-1.46;0.07	-1.44;-0.06	-1.47;-0.04	-1.45;-0.08
Height-for-age									
n	1418	1700	1649	1385	1106	858	694	518	397
Median	-2.34	-2.13	-1.97	-1.92	-1.88	-1.93	-1.76	-1.63	-1.41
IQR	-3.76;-1.02	-3.37;-1.04	-3.09;-0.99	-2.96;-0.96	-2.83;-0.88	-2.67;-0.93	-2.55;-0.90	-2.41;-.077	-2.32;-0.60
Weight-for-height									
n	1412	1696	1648	1385	1102	856	691	514	391
Median	-1.26	0.12	0.36	0.36	0.37	0.35	0.29	0.13	0.09
IQR	-2.73;0.15	-1.01;1.13	-0.56;1.31	-0.51;1.29	-0.45;1.22	-0.41;1.15	-0.52;1.06	-0.52;1.06	-0.68;1.06

Supplementary Digital Content Figure 2: Median (IQR) Haemoglobin over time