

SUPPLEMENTAL DIGITAL CONTENT 1

Table 1: Characteristics of clinics included in the study

		All clinics N=63, N (%)	Programme	
			Workplace N=12, N (%)	Community N=51, N (%)
Type of clinic	Hospital	4 (6.4)	4 (33.3)	
	Workplace	8 (12.7)	8 (66.7)	
	GP	47 (74.6)		47 (92.2)
	NGO	3 (4.8)		3 (5.9)
	Specialist	1 (1.6)		1 (2.0)
Year clinic commenced first patient on first-line ART	2003-2004	12 (19.1)	12 (100.0)	
	2005-2006	47 (74.6)		47 (92.2)
	2007-2008	4 (0.1)		4 (7.8)
Number of patients commenced on first-line ART/clinic	≥500	7 (11.1)	4 (33.3)	3 (5.9)
	250-499	7 (11.1)	2 (16.7)	5 (9.8)
	50-249	49 (77.8)	6 (50.0)	43 (84.3)
Proportion of patients switched from first- to second-line ART/clinic	None	11 (17.5)	0	11 (21.6)
	<2.5%	16 (25.4)	2 (16.7)	14 (27.5)
	2.5-4.9%	16 (25.4)	5 (41.7)	11 (21.6)
	5-7.5%	8 (12.7)	2 (16.7)	6 (11.8)
	>7.5%	12 (19.1)	3 (25.0)	9 (17.7)
Rate of virological failure by clinic (/100py)	Median, IQR	4.8 (3.3-7.7)		
	Number clinics below median	31 (49.2)	0	31 (60.8)
	Number clinics above median	32 (50.8)	12 (100.0)	20 (39.2)
Following first-episode of virological failure				N=50 ¹
Rate of viral re-suppression by clinic (/100py)	Median, IQR	10.62 (0-25.02)		
	Number clinics below median	31 (50.0)	5 (41.7)	25 (50.0)
	Number clinics above median	31 (50.0)	7 (58.3)	25 (50.0)
Rate of switching by clinic (/100py)	Median, IQR	16.98 (2.8-49.73)		
	Number clinics below median	31 (50.0)	7 (58.3)	24 (48.0)
	Number clinics above median	31 (50.0)	5 (41.7)	26 (52.0)

¹In one community clinic all patients with virological failure had less than 6 months potential follow-up, therefore not included in this analysis

Abbreviations: GP, general practitioner clinic; NGO, non-government organisation clinic; py, person-years; IQR, inter-quartile range

Table 2: Factors associated with switching to second-line ART at visits following virological failure: multivariable analysis stratified by programme

		Workplace N=3259 visits; 853 patients; 12 clinics	Community N=1371 visits; 482 patients; 48 clinics
		aOR (95% CI)	aOR (95% CI)
ART exposure pre-programme	Naïve	1	1
	Experienced	0.99 (0.44-2.25)	2.29 (1.37-3.81)
	Missing	0.59 (0.34-1.03)	0.98 (0.58-1.65)
Year of visit	2003-7	1	1
	2008	2.06 (1.29-3.29)	1.26 (0.75-2.12)
	2009	0.92 (0.53-1.58)	1.11 (0.64-1.94)
Clinic contact in 4 months preceding visit	Yes	1	1
	No	0.44 (0.17-1.15)	0.23 (0.1-0.54)
Log₁₀ VL result available at visit	<4¹	1	1
	4-4.99	1.88 (1.08-3.26)	2.97 (1.84-4.78)
	≥5	1.58 (0.84-2.96)	1.3 (0.7-2.42)
VL slope preceding visit	≥50% increase	0.89 (0.58-1.38)	1.4 (0.88-2.22)
	No change	1	1
	≥50% decrease	0.55 (0.33-0.91)	0.86 (0.53-1.41)
CD4 result available at visit (cells/mm³)	≥350	1	1
	200-349	0.99 (0.43-2.28)	1.42 (0.69-2.92)
	100-199	1.07 (0.47-2.43)	1.8 (0.88-3.69)
	<100	2.16 (0.94-4.92)	3.37 (1.58-7.16)
Visit number during episode of virological failure	1-2	1	1
	3-4	1.62 (1.01-2.58)	1.3 (0.81-2.09)
	≥5	1.7 (1.05-2.75)	2.19 (1.28-3.77)

¹ categories (<3 and 3-3.99) grouped due to small number of events following stratification

Abbreviations: OR, odds ratio; aOR, adjusted odds ratio; CI, confidence interval

Table 3: Factors associated with switching to second-line ART at visits following virological failure: multivariable analysis stratified by time between virological failure and visit

		<12 months since diagnosis virological failure N=3241 visits; 1299 patients; 60 clinics aOR (95% CI)	≥12 months since diagnosis of virological failure N=1389 visits; 418 patients; 37 clinics aOR (95% CI)
ART exposure pre- programme	Naïve	1	1
	Experienced	1.97 (1.23-3.16)	1.06 (0.48-2.37)
	Missing	0.71 (0.46-1.11)	0.83 (0.43-1.6)
Year of visit	2003-7	1	1
	2008	1.81 (1.2-2.74)	1.43 (0.74-2.74)
	2009	1.2 (0.75-1.9)	0.95 (0.49-1.86)
Clinic contact in 4 months preceding visit	Yes	1	1
	No	0.3 (0.14-0.67)	0.33 (0.11-1.01)
Log₁₀ VL result available at visit	<3	0.71 (0.2-2.53)	0.38 (0.04-3.18)
	3-3.99	1	1
	4-4.99	2.79 (1.81-4.31)	1.74 (0.87-3.46)
	≥5	1.82 (1.02-3.26)	2.03 (0.86-4.79)
VL slope preceding visit	≥50% increase	1.12 (0.76-1.64)	0.86 (0.48-1.55)
	No change	1	1
	≥50% decrease	0.68 (0.44-1.05)	0.78 (0.4-1.49)
CD4 result available at visit (cells/mm³)	≥350	1	1
	200-349	1.0 (0.53-1.9)	1.41 (0.48-4.13)
	100-199	1.27 (0.67-2.4)	2.03 (0.86-4.79)
	<100	2.43 (1.25-4.7)	2.05 (0.68-6.14)
Visit number during episode of virological failure	1-2	1	1
	3-4	1.45 (1.0-2.11)	1.79 (0.21-15.1)
	≥5	2.16 (1.16-3.99)	1.91 (0.23-15.72)

Abbreviations: OR, odds ratio; aOR, adjusted odds ratio; CI, confidence interval

Table 4: Factors associated with switching to second-line ART at visits following virological failure: multivariable analysis restricted to patients known to be ART naive prior to commencing ART

		aOR (95% CI) N=3023 visits; 865 patients; 53 clinics
Year of visit	2003-7	1
	2008	1.74 (1.13-2.67)
	2009	1.04 (0.64-1.68)
Clinic contact in 4 months preceding visit	Yes	1
	No	0.33 (0.15-0.75)
Log₁₀ VL result available at visit	<3	0.31 (0.04-2.36)
	3-3.99	1
	4-4.99	2.15 (1.34-3.43)
	≥5	1.72 (0.95-3.14)
VL slope preceding visit	≥50% increase	1.04 (0.7-1.54)
	No change	1
	≥50% decrease	0.67 (0.43-1.05)
CD4 result available at visit (cells/mm³)	≥350	1
	200-349	1.1 (0.53-2.27)
	100-199	1.16 (0.56-2.4)
	<100	2.34 (1.11-4.91)
Visit number during episode of virological failure	1-2	1
	3-4	1.4 (0.91-2.16)
	≥5	1.99 (1.28-3.09)

Abbreviations: OR, odds ratio; aOR, adjusted odds ratio; CI, confidence interval

Table 5: Factors associated with switching to second-line ART at visits following virological failure: multivariable analysis stratified by viral suppression prior to virological failure

		Viral suppression, followed by viral rebound 3042 visit; 864 patients; 55 clinics	Patients with no evidence of viral suppression 1588 visits; 481 patients; 54 clinics
		aOR (95% CI)	aOR (95% CI)
ART exposure pre-programme	Naïve	1	1
	Experienced	1.75 (1.06-2.86)	1.44 (0.69-3.03)
	Missing	0.81 (0.47-1.38)	0.65 (0.37-1.15)
Year of visit	2003-7	1	1
	2008	1.81 (1.17-2.82)	1.67 (0.95-2.93)
	2009	1.08 (0.67-1.73)	1.00 (0.52-1.9)
Clinic contact in 4 months preceding visit	Yes	1	1
	No	0.44 (0.21-0.89)	0.13 (0.03-0.58)
Log₁₀ VL result available at visit	<3	0.55 (0.15-1.95)	0.98 (0.09-10.58)
	3-3.99	1	1
	4-4.99	2.53 (1.63-3.94)	3.07 (1.48-6.36)
	≥5	2.49 (1.35-4.59)	1.84 (0.78-4.35)
VL slope preceding visit	≥50% increase	0.74 (0.49-1.1)	2.06 (1.21-3.52)
	No change	1	1
	≥50% decrease	0.6 (0.38-0.93)	1.00 (0.54-1.87)
CD4 result available at visit (cells/mm³)	≥350	1	1
	200-349	1.19 (0.61-2.35)	0.98 (0.36-2.63)
	100-199	1.44 (0.73-2.84)	0.95 (0.36-2.53)
	<100	2.78 (1.36-5.67)	2.27 (0.86-6.0)
Visit number during episode of virological failure	1-2	1	1
	3-4	1.34 (0.87-2.06)	1.85 (1.08-3.17)
	≥5	1.71 (1.09-2.69)	2.3 (1.25-4.23)

Abbreviations: OR, odds ratio; aOR, adjusted odds ratio; CI, confidence interval