

Attrition through Multiple Stages of HIV Care in South Africa: A Challenge for Test-and-Treat

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ABSTRACT

Introduction: While momentum for test-and-treat strategies has been increasing in resource limited settings, if patients cannot be retained in HIV care continuously from the time of testing positive through long term adherence to antiretroviral therapy (ART), such strategies may fall well short of the expected gains. While numerous estimates of retention on ART exist, few cohorts have data on retention from testing positive through pre-ART and on ART care.

Methods: We explored attrition (loss or death) at the Themba Lethu HIV clinic in Johannesburg, South Africa in 3 cohorts enrolled at HIV testing, pre-ART care initiation, and ART initiation. Loss was defined as ≥ 3 months late for the ART and pre-ART cohorts and ≥ 1 month late for the VCT cohort. Follow-up time accrued from the beginning of the stage until LTF, death, 12 months of follow up, or dataset closure on December 5, 2012.

Results: Between March 2010 and December 2011 we enrolled 229 patients testing HIV+, 134 initiating pre-ART care, and 152 initiating ART. By Kaplan-Meier analysis, attrition through 12 months from HIV testing was 62.9%, from pre-ART initiation was 21.4% and from ART initiation was 11.8%. In rates per 100 person months, attrition was highest in the VCT cohort (10.1; 95%CI: 8.6-12.0) and lower in the pre-ART (1.9; 95%CI: 1.3-2.7) and ART cohorts (1.0; 95%CI: 0.7-1.6).

Of the 229 patients enrolled at testing HIV+, 54.6% were lost, 8.3% died, 0.4% are in pre-ART care and 36.7% are on ART. Of the 134 patients enrolled at pre-ART care, 17.2% were lost, 3.0% died, 24.6% are still in pre-ART and 55.2% are on ART. Of the ART cohort, 8.6% were lost, 3.3% died and 88.2% are still on ART. Multiplying these parameters, we estimate only 32.8% of patients are retained from testing HIV+ through one year on ART. While predictors of attrition (see table) differed by stage, attrition rates differed by age and sex. Being born in South Africa (HR: 2.31; 95% CI: 0.54, 9.89) was predictive of attrition in the pre-ART cohort and baseline CD4 count was for ART patients (>200 vs. <100 , RR: 0.32; 95% CI: 0.08, 1.34).

Conclusions: Our findings from a well-resourced clinic demonstrate continual loss from all stages of HIV care and low overall retention. This poses a threat to the effectiveness of plans for test-and-treat strategies. Such projects must pay careful attention to maintain constant patient care if such strategies are to produce expected reductions in transmission.

BACKGROUND

While momentum for test-and-treat strategies has been increasing in resource limited settings, if patients cannot be retained in HIV care continuously from the time of testing positive through long term adherence to antiretroviral therapy (ART), such strategies may fall well short of the expected gains.

While numerous estimates of retention on ART exist, few cohorts have data on retention from testing positive through pre-ART and on ART care.

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METHODS

We explored attrition (loss or death) at the Themba Lethu HIV clinic in Johannesburg, South Africa in 3 cohorts :

- Cohort 1 was enrolled at HIV testing (VCT)
- Cohort 2 was enrolled at pre-ART care initiation
- Cohort 3 was enrolled at ART initiation

From March 2010 to December 2011 we enrolled 229 patients testing HIV+, 134 initiating pre-ART care, and 152 on ART.

Study Population

Enrolled patients at the Themba Lethu Clinic were those who met the inclusion criteria of one of the three cohorts and:

- Were ≥ 18 years old
- Were willing to provide informed consent

Participants filled out a short questionnaire at enrollment

Participants provided information for follow up outcome determination in the cohort

Analytic Variables

Loss was defined as ≥ 3 months late for the ART and pre-ART cohorts and ≥ 1 month late for the VCT cohort.

Follow-up time accrued from the beginning of the stage until LTF, death, 12 months of follow up, or dataset closure on December 5, 2012.

Matched data from all patients lost to follow up to the national death registry to confirm final outcomes.

Statistical Methods

We calculated program attrition from each cohort using Kaplan-Meier analysis and present as proportions. We looked for predictors of attrition between groups using proportional hazards regression.

RESULTS

Table 1 - Cohort characteristics

Variable	Exposure	VCT Cohort	Pre-ART Cohort	ART Cohort
Total		229 (100%)	134 (100%)	152 (100%)
Gender	Male	105 (45.9%)	33 (24.6%)	32 (21.1%)
	Female	124 (54.2%)	101 (75.4%)	120 (78.9%)
Age at Interview	Median (IQR)	35.5 (28.5 - 42.7)	35.2 (29.6 - 41.2)	37.4 (31.5 - 43.9)
	<30	67 (29.3%)	34 (25.4%)	29 (19.1%)
	30-34	40 (17.5%)	32 (23.9%)	29 (19.1%)
	35-39	42 (18.3%)	26 (19.4%)	35 (23.0%)
	40-44	33 (14.4%)	18 (13.4%)	24 (15.8%)
	≥ 45	47 (20.5%)	24 (17.9%)	35 (23.0%)
Country of Birth	South Africa	205 (89.5%)	113 (84.3%)	131 (86.2%)
	Other	24 (10.5%)	21 (15.7%)	21 (13.8%)
Marital Status	Single/Engaged	161 (70.3%)	91 (67.9%)	104 (68.4%)
	Married/Divorced/Widowed	68 (29.7%)	43 (32.1%)	48 (31.6%)
Education Level	Never attended school	4 (1.8%)	3 (2.2%)	4 (2.6%)
	At least some primary school	42 (18.3%)	18 (13.4%)	30 (19.7%)
	At least some high school	166 (72.5%)	109 (81.3%)	89 (58.6%)
	Post-matric training/University degree	17 (7.4%)	5 (3.9%)	5 (3.3%)
Employment Status	Employed	136 (59.4%)	90 (67.2%)	92 (60.5%)
	Unemployed/Studying/Retired	93 (40.6%)	44 (32.8%)	60 (39.5%)
Type of Transport	Used minibus taxi	156 (68.1%)	114 (85.1%)	126 (82.9%)
	Other	73 (31.9%)	20 (14.9%)	26 (17.1%)
Time to Get to Clinic	Missing	0 (0.0%)	2 (1.5%)	4 (2.6%)
	≤ 30 minutes	91 (39.7%)	36 (26.9%)	30 (19.7%)
	31-60 min	96 (41.9%)	53 (39.6%)	68 (44.7%)
	more than 1 hour	42 (18.3%)	43 (32.1%)	50 (32.9%)
Household Size	Missing	1 (0.4%)	0 (0.0%)	0 (0.0%)
	≤ 3 people	146 (63.8%)	86 (64.2%)	93 (61.2%)
	≥ 4 people	82 (35.8%)	48 (35.8%)	59 (38.8%)
CD4 Count (cells/mm ³) [†]	Median (IQR)	180.5 (94 - 319.5)	233.5 (144 - 377)	158 (93 - 198)
	Missing	117 (51.1%)	0 (0.0%)	14 (9.2%)
	<100	30 (13.1%)	20 (14.9%)	39 (25.7%)
	100-199	31 (13.5%)	38 (28.4%)	68 (44.7%)
	200-350	30 (13.1%)	37 (27.6%)	31 (20.4%)
	>350	21 (9.2%)	39 (29.1%)	0 (0.0%)
Outcome	Alive and in care	85 (37.1%)	107 (79.8%)	134 (88.2%)
	Dead	19 (8.3%)	4 (3.0%)	5 (3.3%)
	Lost to follow-up	125 (54.6%)	23 (17.2%)	13 (8.6%)

[†]At interview for the VCT cohort, first done for the Pre-ART cohort, and baseline for the ART cohort

Of the 229 patients enrolled at testing HIV+, 54.6% were lost, 8.3% died, 0.4% are in pre-ART care and 36.7% are on ART.

Of the 134 patients enrolled at pre-ART care, 17.2% were lost, 3.0% died, 24.6% are still in pre-ART care and 55.2% are on ART.

Of the ART cohort, 8.6% were lost, 3.3% died and 88.2% are still on ART.

Multiplying these parameters, we estimate only 32.8% of patients are retained from testing HIV+ through one year on ART.

Table 2 – Predictors of attrition for three cohorts

Characteristic	VCT cohort Adjusted HR (95% CI)	Pre-ART cohort Adjusted HR (95% CI)	ART cohort Adjusted HR (95% CI)
Sex			
Male	1.08 (0.77, 1.52)	1.06 (0.44, 2.57)	3.23 (1.08, 9.63)
Female	Reference	Reference	Reference
Age at Interview			
<30	1.22 (0.77, 1.94)	4.09 (0.88, 19.02)	2.73 (0.51, 14.48)
30-34	0.61 (0.34, 1.08)	1.96 (0.38, 10.15)	2.20 (0.44, 11.13)
35-39	0.80 (0.47, 1.38)	3.88 (0.82, 18.31)	2.27 (0.49, 10.51)
40-44	0.62 (0.34, 1.14)	1.43 (0.20, 10.29)	0.75 (0.07, 7.52)
>45	Reference	Reference	Reference
CD4 Count (cells/mm³)			
Missing	2.53 (1.40, 4.58)	--	0.91 (0.17, 4.77)
<100	Reference	Reference	Reference
101-200	1.13 (0.52, 2.46)	--	0.39 (0.12, 1.22)
>200	1.15 (0.58, 2.25)	--	0.32 (0.08, 1.34)
Country of Birth			
South Africa	--	2.31 (0.54, 9.89)	0.20 (0.06, 0.69)
Other	--	Reference	Reference
Marital Status			
Never been married	--	--	Reference
Have been married	--	--	0.45 (0.12, 1.70)
Education Level			
Primary school or less	--	--	--
High school or more	--	--	--
Employment Status			
Unemployed	1.19 (0.83, 1.70)	--	3.84 (1.24, 11.95)
Employed	Reference	--	Reference
Household Size			
3 or Fewer People	--	--	--
4 or More People	--	--	--
Type of Transport			
Minibus Taxi	Reference	--	--
Other	1.53 (1.07, 2.18)	--	--
Transport Time			
30 Minutes or Less	--	--	--
31-60 Minutes	--	--	--
More than 60 Minutes	--	--	--

Taking transport other than a minibus taxi was predictive of attrition for VCT patients

Being less than 30 compared to at least 45 years old (HR: 4.09; 95% CI: 0.88, 19.02) and being born in South Africa (HR: 2.31; 95% CI: 0.54, 9.89) were predictive of attrition in the pre-ART cohort and baseline CD4 count was for ART patients (>200 vs. <100 , RR: 0.32; 95% CI: 0.08, 1.34).

CONCLUSIONS

Our findings from a well-resourced clinic demonstrate continual loss from all stages of HIV care and low overall retention. This poses a threat to the effectiveness of plans for test-and-treat strategies. Such projects must pay careful attention to maintain constant patient care if such strategies are to produce expected reductions in transmission.

