



# HOME VS. SELF-INITIATED ART REFILL: CLINICAL, IMMUNOLOGICAL, AND VIROLOGIC OUTCOMES



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## Introduction

Antiretroviral therapy (ART) delivery by courier to the patient's home (home refill) is a novel intervention that may improve clinical outcomes and reduce indirect costs for individuals in low- and middle-income countries (LMICs). We aimed to compare clinical and virologic outcomes for patients obtaining medication refills at their local pharmacy (self refill) vs. home refill in Aid for AIDS (AFA), a large South African private sector HIV/AIDS programme.

## Methods

Antiretroviral therapy (ART) delivery by courier to the patient's home (home refill) is a novel intervention that may improve clinical outcomes and reduce indirect costs for individuals in low- and middle-income countries (LMICs). We aimed to compare clinical and virologic outcomes for patients obtaining medication refills at their local pharmacy (self refill) vs. home refill in Aid for AIDS (AFA), a large South African private sector HIV/AIDS programme.

Retrospective cohort analysis of ART naïve HIV-infected adults in AFA who initiated first line NNRTI based ART regimen between January 2002 and July 2010 was performed. Patients were selected to switch to home refill based on the discretion of AFA. Primary endpoint was all-cause mortality; secondary endpoints were viral suppression (VL < 400 copies/mL) and median CD4+ T-cell response (cells/μl) (from baseline) at 6-month intervals. We compared the crude survival between self-refill and home refill using Kaplan–Meier plots and a log-rank test. We performed Cox regressions to model the individual and simultaneous effects of baseline variables and mode of ART delivery on all-cause mortality, adjusting for propensity score.

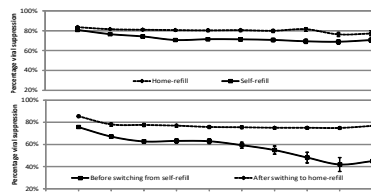
## Acknowledgements

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## Results

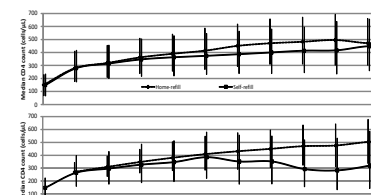
40,939 patients, contributing over 100,000 years of follow-up were recorded. The most common first line regimen was efavirenz + lamivudine + zidovudine, followed by efavirenz + emtricitabine + tenofovir in later years.

Emerging at 24 months, the home refill group had improved median CD4+ T- cell count response (451 vs. 387, respectively, p < 0.01) compared to the self-refill group – see figure 1. Equally, the likelihood of virologic suppression improved (81% versus 71%, respectively, p-value <0.001) compared to the self-refill group – see figure 2.



Months since starting antiretrovirals	6	12	18	24	30	36	42	48	54	60
Control - self-refill from start	% suppressed (n/N)	81 (1560)	77 (1525)	74 (1478)	71 (1431)	71 (1424)	71 (1417)	69 (1410)	69 (1403)	71 (1396)
Home refill from start	% suppressed (n/N)	81 (1560)	82 (1575)	81 (1590)	81 (1605)	80 (1620)	82 (1635)	82 (1650)	82 (1665)	81 (1680)
Switched from self to home-refill	Before	% suppressed (n/N)	76 (1514)	77 (1529)	78 (1544)	79 (1559)	79 (1574)	79 (1589)	79 (1604)	79 (1619)
Alter	% suppressed (n/N)	76 (1514)	77 (1529)	78 (1544)	79 (1559)	79 (1574)	79 (1589)	79 (1604)	79 (1619)	79 (1634)

Figure 1: Comparing median CD4+ cell count (cells/μl) response from baseline to 60 months on antiretroviral therapy with interquartile ranges for home-refill by courier with (a) self-refill and (b) switching from self-refill to home-refill by courier



Months since starting antiretrovirals	6	12	18	24	30	36	42	48	54	60
Control - self-refill from start	Median (IQR)	350 (250-450)	370 (270-470)	390 (290-490)	410 (310-510)	430 (330-530)	450 (350-550)	470 (370-570)	490 (390-590)	510 (410-610)
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Figure 2: Comparing median HIV viral load (copies/ml) response from baseline to 60 months on antiretroviral therapy with interquartile ranges for home-refill by courier with (a) self-refill and (b) switching from self-refill to home-refill by courier

## Discussion

Home refill is associated with improved clinical, immunological, and virologic outcomes compared to self-refill for HIV-infected adults in this private AIDS programme in South Africa. Home refill offers a promising additional option to the growing ART service delivery models and should facilitate the UNAIDS 90-90-90 targets in LMICs.



Home refill (vs. self-refill) was associated with better survival (adjusted hazard ratio = 0.90 [95% CI: 0.84-0.96] (Table 1), p-value for log-rank test < 0.001) (Figure 3).

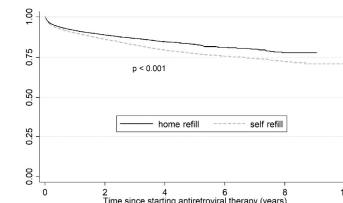


Figure 3: Kaplan-Meier plot of home-refill versus self-refill with log-rank test

Variables	Hazard ratio (95% CI)	p-value	Multivariate Hazard ratio (95% CI)	p-value	
Antiretroviral dispensing	home-refill 0.88 (0.82 to 0.95)	<0.001	0.9 (0.84 to 0.96)	0.003	
self-refill	referent				
Baseline NNRTI	efavirenz 1.13 (1.03 to 1.23)	0.012	1.14 (1.04 to 1.25)	0.006	
nevirapine	referent				
tenofovir	referent				
Baseline NRTI	other 1.95 (1.26 to 3)	0.003	1.91 (1.24 to 2.94)	0.003	
zidovudine	1 (0.85 to 1.19)	0.957	0.87 (0.78 to 0.96)	0.008	
stavudine	1.09 (0.94 to 1.26)	0.255	0.99 (0.88 to 1.1)	0.813	
Sex	female	referent			
male	1.04 (0.92 to 1.17)	0.562	1.15 (1.08 to 1.23)	<0.001	
Age on starting antiretroviral therapy (years)	<25	0.81 (0.63 to 1.06)	0.121	0.74 (0.58 to 0.94)	0.014
25-49	referent				
≥50	1.5 (1.35 to 1.66)	<0.001	1.58 (1.45 to 1.73)	<0.001	
Baseline viral load (copies/ml)	<100,000	0.71 (0.43 to 1.18)	<0.001	0.73 (0.44 to 1.21)	0.217
100,000-999,999	referent				
>1,000,000	1.78 (1.15 to 2.76)	0.19	1.85 (1.2 to 2.85)	0.005	
Baseline CD4 category (cells/μl)	≥500	1.96 (1.75 to 2.2)	<0.001		
200-349	referent				
>350	1.11 (0.87 to 1.42)	0.415	1.09 (0.85 to 1.39)	0.084	
2002-2003	2.4 (2.13 to 2.71)	<0.001	2.25 (2.03 to 2.49)	<0.001	
2004-2005	1.53 (1.38 to 1.71)	<0.001	1.55 (1.39 to 1.73)	<0.001	
2006-2007	1.16 (1.06 to 1.28)	0.002	1.19 (1.09 to 1.31)	<0.001	
2008+	referent				
Body Mass index (kg/m <sup>2</sup> )	<18	1.52 (1.3 to 1.78)	<0.001	1.56 (1.33 to 1.83)	0.003
18-24	referent				
25-34	0.82 (0.72 to 0.93)	0.007	0.8 (0.7 to 0.91)	0.003	
≥35	0.7 (0.53 to 0.92)	0.013	0.67 (0.51 to 0.88)	0.006	

Table 1: Cox regression table comparing multivariate analyses with or without propensity score

