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Patient-reported factors associated with reengagement among HIV-infected patients disengaged from care in East Africa

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Abstract

Objective—Engagement in care is key to successful HIV treatment in resource-limited settings; yet little is known about the magnitude and determinants of reengagement among patients out of care. We assessed patient-reported reasons for not returning to clinic, identified latent variables underlying these reasons, and examined their influence on subsequent care reengagement.

Design—We used data from the East Africa International Epidemiologic Databases to Evaluate AIDS to identify a cohort of patients disengaged from care (>3 months late for last appointment, reporting no HIV care in preceding 3 months) ($n = 430$) who were interviewed about reasons why they stopped care. Among the 399 patients for whom follow-up data were available, 104 returned to clinic within a median observation time of 273 days (interquartile range: 165–325).

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Conflicts of interest
There are no conflicts of interest.

Methods—We conducted exploratory and confirmatory factor analyses (EFA, CFA) to identify latent variables underlying patient-reported reasons, then used these factors as predictors of time to clinic return in adjusted Cox regression models.

Results—EFA and CFA findings suggested a six-factor structure that lent coherence to the range of barriers and motivations underlying care disengagement, including poverty, transport costs, and interference with work responsibilities; health system 'failures,' including poor treatment by providers; fearing disclosure of HIV status; feeling healthy; and treatment fatigue/seeking spiritual alternatives to medicine. Factors related to poverty and poor treatment predicted higher rate of return to clinic, whereas the treatment fatigue factor was suggestive of a reduced rate of return.

Conclusion—Certain barriers to reengagement appear easier to overcome than factors such as treatment fatigue. Further research will be needed to identify the easiest, least expensive interventions to reengage patients lost to HIV care systems. Interpersonal interventions may continue to play an important role in addressing psychological barriers to retention.

Keywords

Africa; antiretroviral therapy; loss to follow-up; mortality

Introduction

Engagement in care is increasingly recognized as the key to success in HIV care and treatment programs in resource-limited settings. The cascade of care – the most common heuristic representing the macroscopic steps in HIV care delivery – depicts this process as starting with HIV testing, and then proceeding through linkage, staging, antiretroviral therapy (ART) initiation, and retention on ART [1]. At each of these steps, however, patients can both engage and disengage from care, perhaps repeatedly [2]. Research on engagement in care for HIV-infected patients, therefore, must account for and explore the experience both of passing though steps of the cascade as well as cycling in and out of the health system within each step. In particular, patients in resource-limited settings face numerous challenges – economic, social, and psychological – to continuous engagement in care. Therefore, reengagement is, in our view, a part of the natural history of HIV care.

Existing literature about engagement contains little information about the magnitude and determinants of reengagement among those patients who have fallen out of care. Engagement literature in resource-limited settings is largely focused on quantifying the occurrence of loss to follow-up [3–7], but we know little about the kinetics of return to care after becoming lost to follow-up. Moreover, the definition of loss to follow-up varies widely across programs and countries. Existing studies, which are drawn from real-world settings, typically examine the relationship between sociodemographic factors measured in routine care and engagement. These factors (such as sex, $CD4^+$ cell count) are important predictors, but do not capture the underlying reasons from a patient perspective. Engagement in HIV care has been found to be threatened by a range of barriers, including psychological factors (e.g. stigma) [8–10], clinic characteristics (e.g. waiting times) [11,12], and structural barriers [10,13] such as distance to clinic and transportation costs [10,12,14,15]. But these categories have not been formally evaluated for content validity, and may or may not represent coherent latent constructs (i.e. variables, representing abstract concepts, that are not directly measured, but rather are inferred through a mathematical model from other variables that are directly measured).

We assessed reasons given by patients for not returning to clinic after loss to follow-up, using responses to a theory-informed questionnaire. We then conducted factor analyses to identify interpretable latent variables underlying these reasons. Finally, we used the latent variables as predictors to examine time to clinic return in a cohort of patients disengaged from care, to examine drivers of reengagement – a distinct and relatively neglected step in the cascade of HIV care.

Methods

Study participants

We used data collected from a population of HIV-infected adults who were lost to follow-up (defined as at least 90 days late for their last scheduled clinic visit) and out of care, in a study where patients lost in five program settings were intensively traced to identify their outcomes. The patients include those not yet on ART as well as on ART at the time they became lost to follow-up. The five programs – all of which participate in the East Africa International Epidemiologic Databases to Evaluate AIDS – are located in Eldoret, Kenya; Kisumu, Kenya; Kampala, Uganda; Mbarara, Uganda; and Morogoro, Tanzania. The population for this analysis comprised 430 lost patients who were successfully traced and found to be out of care.

Measurements

Sociodemographic (e.g. sex and age at enrollment) and clinical data ($CD4^+$ values, WHO Stage, and visit dates) were abstracted from electronic databases at each of the clinics. Patients who were traced and found alive were asked whether they had enrolled at a new clinic; those who had not, and reported no care, were asked for reasons for why they stopped HIV care. A checklist of 30 possible reasons for dropping out of care was used (these were close-ended items, with one additional open text field to specify ‘other reason’). This checklist was derived from the Behavioral Model for Vulnerable Populations and grouped into structural (or external environment), clinic-based (or healthcare environment), and patient-based (psychosocial or sociodemographic) reasons for disengagement from care [16]. Reasons that emerged, which were not coded, were recorded in free text and mapped to coded response categories. In each of these settings, the tracers provided counseling about the importance of HIV care and encouragement to return to care, but no other inducements (such as incentives) were administered. Data about visits subsequent to the tracing were available in only four of the five settings and, therefore, the analysis of time to return included only data from four sites.

Analysis

Exploratory factor analyses (EFA) were conducted to study the dimensionality of the set of variables for reasons for dropping out of care that were reported by patients, and identify the number of unobserved constructs, or latent factors, underlying these reasons. EFA models were fit using Mplus version 7 [17] using a robust weighted least squares approach (weighted least squares means and variance adjusted estimation) with oblique rotation of the extracted factor loadings (which assumes factors are correlated). For factor analysis, the advantage of using Mplus was that it permitted categorical estimators: floor and ceiling effects (i.e. variables with disproportionate number of responses loaded on the low or high end of the Likert scale) and considerable skewness for some variables were seen with a StataSE 13.1 [18] model using continuous estimators, suggesting that an EFA solution with categorical estimators with Mplus was more satisfactory. Goodness of fit of the EFA model to the data was assessed with the following indices: Bentler's comparative fit index (CFI) [19,20], the root mean square error of approximation (RMSEA) [21], and the weighted root mean square residual (WRMR) [22]. We then conducted a confirmatory factor analyses (CFA) using the same dataset, to investigate the EFA solution more fully and estimate factor item coefficients with their 95% confidence intervals (CI). We applied the same criteria of model fit to the CFA solution. Standardized factor scores were retained for subsequent analyses. We estimated the cumulative incidence of return to clinic after contact in the field. We then used Cox proportional hazards regression to model the association between each of the factors and rate of return. We used directed acyclic graphs encoding our hypothesized causal relationships to guide multivariable analysis and adjustment decisions [23]. Selection of the minimum sufficient adjustment sets to identify the effect of each dimension of factors on reengagement was aided through use of DAGitty software [24]. StataSE 13.1 [18] was used to generate descriptive statistics and correlation matrices, as well as for fitting Cox regression models to estimate the associations between factors and a later return to clinic within the study period.

Results

Patient characteristics

The analyses were conducted in the population of 430 patients lost to follow-up who were traced and found to be out of care. The population was disproportionately female (65%), with a median age of 31; education level data were missing for much of the sample but the majority (37%) had completed only primary education (Table 1), as has been observed in other populations in this setting. Data on marital status were missing for a large portion of the population, but the majority (33%) was currently married. Patients from clinics in Kenya comprised most of the sample (67%), followed by Tanzania (19%) and Uganda (13%). Almost half of the sample had been on ART (49%), 34% were not yet eligible for ART and 17% were eligible but had dropped out of care before starting ART.

Table 2 shows the frequencies and percentages of response items (categories not mutually exclusive) to the question ‘Why did you stop going to any clinic for your HIV care?’ The items are shown in order of magnitude, for example, ‘I felt well and thought I didn't need care’ (32%), ‘Transportation was difficult or expensive’ (30%), and ‘Work interfered with picking up meds or visiting clinic’ (24%). Some items, for example, ‘I didn't have enough food’ (3%) were rarely mentioned; items with 10 or fewer ‘yes’ responses are not shown.

Exploratory factor analysis of questionnaire items on reasons for disengagement from care

Of the 31 close-ended response items for reasons the individual dropped out of care, 19 items with over 10 ‘yes’ responses were retained (including the new item ‘patient moved’, recoded from ‘other’ reason). Two new combined variables were created in instances where source variables measured very similar and highly correlated items (‘The medicine was not making me feel better’ was combined with ‘I was experiencing side effects from the medicine’ and ‘Because I went to someone who tried/is trying to cure me by prayer/religious rituals’ was combined with ‘Because I saw/am seeing a traditional healer instead’.) We conducted an initial EFA with oblique rotation and no number of factors specified. The first EFA indicated six factors with eigenvalues that exceeded 1.0. A Cattell scree plot showed minimal additional contributions to variance from factors beyond the sixth factor, suggesting that six or possibly five-factor solutions should be reviewed. A number of four, five and six-factor EFA solutions were then carried out and reviewed in sequence. At each step, we carried out an item-by-item review of the rotated factor loadings (the standardized regression coefficients) within the pattern matrix. Factors with split or low factors loadings (<0.20) were removed.

A six-factor EFA structure containing the best performing subset of items from the original 30 ‘reasons’ questionnaire items was found to have a cleaner fit to the data than was seen in the four and five-factor solutions, with clearly interpretable results. This solution, shown in Table 3, was assessed using model fit indices. The criteria for acceptable model fit are indicated by a CFI value of 0.9 or higher [25], and a RMSEA value of 0.08 or lower [21,25]. The residual-based measure of goodness of fit, the WRMR, should be less than 1, with a WRMR of 0.95 or lower indicating high confidence [22,26]. For the χ^2 test of model fit, which tests that the model does not fit significantly worse than a model where the variables correlate freely – *P*-values of greater than 0.05 (nonsignificant) indicate good fit. The results of tests of goodness of fit for the six-factor EFA solution indicated good fit across all of these criteria, with a χ^2 test of model fit (*P*) value of 0.814, RMSEA of 0.00, CFI of 1.00, and standardized root mean square residual of 0.059.

The questionnaire items organized by the six-factor structure are shown in Table 3. The loadings for the rotated factors extracted in this solution are shown in the column labeled ‘EFA’, and the confirmatory factor loadings are given in the column labeled ‘CFA’, with corresponding confidence intervals. Based on both expectations from prior ethnographic work and the empirical aggregation of the items with the factors, the six factors were labeled: poverty, inconvenience/work inference, poor treatment/quality of care at clinic, fear of disclosure of HIV status, healthy/family provider/migrant, and treatment fatigue/seeking spiritual healing. The questionnaire item stems corresponding to each of these factors are provided in Table 3.

We then applied a CFA using the six subscales implied by the EFA solution, fitted to the same data. CFA models may be employed to further refine and assess the results derived from EFAs, because CFAs provide tests of parameters estimates and model goodness of fit [26]. The results of this exercise showed moderately good model fit and a confirmation of the six-factor structure. The RMSEA was 0.019, the CFI value was 0.970, and the WRMR was 0.858, all of which met the criteria of acceptable model fit. The factor item loadings were overall high and comparable to those derived from the EFA, but some items loaded weakly, for example, ‘I felt well and thought I didn't need care’. Overall, the strongest results were seen for factor 6, treatment fatigue/seeking spiritual healing, and for factor 2, fear of disclosure of HIV status, despite the paucity of items related to fears of disclosure.

Factors associated with reengagement in care

Of the 430 patients lost to follow-up, traced, and found to be out of care, 104 subsequently returned to the clinic at which they had initially enrolled within the study period. Among the 399 patients from the four sites who had follow-up data after the interview available, the median observation time was 273 days (interquartile range: 165–325). Table 4 shows adjusted hazard ratios for associations of each factor with the subsequent care reengagement. Application of a directed acyclic graph to encode assumed causal relationships between each factor, as well as sociodemographic and clinical characteristics, suggested different adjustment approaches for each factor (Supplemental Fig. 1, http://links.lww.com/QAD/A816). As shown, patients who reported barriers related to poverty (including transportation costs) had a significantly increased rate of return to clinic compared with those who did not (hazard ratio: 1.47, 95% CI: 1.13–1.91) after adjustment for ART status of patient, $CD4^+$ cell count, age, and sex. Similarly, patients who reported barriers related to poor care (including poor treatment by staff) also returned at a significantly higher rate (hazard ratio: 1.39, 95% CI: 1.14–1.71), adjusting for the poverty factor and the ART program site. The association between the factor related to treatment fatigue/seeking spiritual healing and a reduced rate of reengagement approached statistical significance (hazard ratio: 0.70, 95% CI: 0.48–1.02), after adjustment for ART status, and the factors related to fear of disclosure, poor treatment/quality of care at the clinic, and inconvenience/work interference. The other factors were not associated with rate of return.

Discussion

This study's unique design, in which the study team traced, visited, and interviewed patients lost to follow-up and found to be out of care, and then watched for their return, provided an unusual opportunity in which to study factors predictive of care reengagement. Our actions with the patients, in this process, may have been an important, yet untestable effect modifier in this population for the various factors that were investigated. We have characterized a population of patients that is important to the cascade of care, but who have been a mystery to date: this study contributes new knowledge concerning the barriers to reengagement in care among HIV-infected patients out of care.

The study is subject to several limitations. Although tracing was carried out and barriers assessed in all 430 patients in this study, one site was unable to provide data on return to clinics after that interview. This site had 31 patients. Therefore, of the 430 assessed for barriers, only 399 could be assessed for return to clinic. In addition, a limitation of the present analysis is that we do not have data on entry into another clinic after interview with our tracer. We only ascertained return to care if the patients returned to the clinic from which they were lost to follow-up. As a result, our estimates of return to care could be biased. Our inability to account for morbidity or mortality between tracing and interview also limits the assessment of clinical 'risk' in this population. Furthermore, the data for this study were not designed for the purposes of EFA, CFA, and scale development. EFA and CFA usually require a set of variables that has been carefully developed to measure certain domains. The data for this study were derived from a 'checklist' questionnaire with dichotomous response categories, which limit data variability for the purposes of EFA. The number of factors derived in EFA can be influenced by the number of variables per factor, and ideally in EFA and CFA, a similar number of variables per factor – at least four or five variables per factor – is recommended. The analyses were also limited by a smaller than ideal number of items that could contribute to a full exploration of the latent constructs. CFA is usually used to study how well a hypothesized factor model fits a new sample from the same population or a sample from a different population – in this study we are using CFA in the same population, within the same dataset, and thus this is a more tentative CFA model supporting the EFA solution. Ideally, using psychometric approaches to survey instrument design, future large-scale studies should be conducted to meas ure each of the six dimensions of reasons for care disengagement suggested by the study, and examine the factor solution we have proposed in other populations. Finally, standardized coefficients for two of the EFA/CFA items are >1 because the residual variances for these items are negative. Theoretically, a solution with a negative residual variance is inadmissible, but can occur by chance in samples, especially when the number of factors is large relative to the number of items. In this sample, despite slightly better model fit with five factors, a six-factor solution provided the best fit to theory, with all of the factors conceptually distinct and interpretable.

From the EFA and CFA of questionnaire item responses, barriers to reengagement in care coalesced into six factors – and these latent constructs lend coherence to behavioral dimensions underlying barriers and motivations related to disengagement from care. The six factors encompass the range of practical and structural barriers faced by patients, including poverty/transport costs and interference with work responsibilities; health system-related 'failures' including poor treatment by providers; HIV-related stigma in communities that exacerbate patients' fears of disclosure of HIV status at clinics; and psychosocial barriers, including feeling that one is healthy and does not need care (denial), treatment fatigue, and the concomitant desire to seek spiritual alternatives to medical treatment. We found that two of these factors predicted subsequent higher rate of return to clinic, namely poverty and poor treatment/quality of care at clinic; these findings suggest that these barriers were less intractable to overcome for patients, in comparison to the finding that treatment fatigue/seeking spiritual healing was suggestive of a reduced rate of return, and factors such as fear of disclosure that were not significantly associated with care reengagement.

Ideally, these findings should be explored in further research to explore more thoroughly these potential dimensions of barriers to reengagement, and to confirm results. Such future research would involve developing a formal survey instrument informed by the present findings, to measure the reasons for care disengagement and assessment of convergent, divergent, and predictive validity, then refining and testing the scale in diver se settings and populations in the region. We may speculate that poverty is a relative state with respect to care engagement: for instance, the poorest patients may forego clinic appointments for food, but may later choose to forego food for a clinic visit when feeling ill. It may also be a transient state, as when economic windfalls (for instance, selling livestock) facilitate care seeking. Findings would suggest that ‘cash transfer’ interventions could facilitate care engagement for patients experiencing poverty-related barriers. We may also speculate that for patients out of care because of poor quality of care or mistreatment by providers, this barrier may be overcome by the patient's assessment of their own health as being poor or in danger of deteriorating. Additional research is also needed to better understand patients’ perspectives on quality of care, to develop interventions that enhance factors that patient consider contribute to good quality care, and to test the impact of these interventions on engagement in HIV care and treatment. Such research would have great utility for intervention and clinical practice; ultimately, its aim would be to identify the easiest, least expensive interventions to reengage patients lost to the HIV care system. Finally, although a great deal of attention has been paid to addressing structural barriers to retention through interventions such as decentral ization, or task shifting, these findings suggest that counseling and other interpersonal interventions will continue to also play an important role in addressing the psychological barriers to continuous, ongoing engagement in care, such as treatment fatigue.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Characteristics of the sample (*N* = 430).

Characteristic	***N***	**%**
Age		
Mean years (SD): 32.2 (9.4)	–	–
Median years (IQR): 31 (26–37)	–	–
Range: 13–69	–	–
Sex		
Women	281	65.35
Men	149	34.65
Completed education level		
None	4	0.93
Primary	159	36.98
Secondary	78	18.14
Tertiary	17	3.95
Missing	172	40.00
Marital status		
Separated	32	7.44
Divorced	5	1.16
Widowed	27	6.28
Single	61	14.19
Married	141	32.79
Missing	164	38.14
Nation		
Kenya	290	67.44
Uganda	57	13.26
Tanzania	83	19.30
Clinical status for ART		
On ART	211	49.07
Eligible but not started	74	17.21
High CD4$^+$ cell count/not eligible	145	33.72
Patient revisited ART clinic after tracking date		
No	320	74.42
Yes	110	25.58
Missing	31	7.21

Data are shown for *n* = 430 patients tracked after 'lost to follow up' in study clinics within the study period, who had dropped out of care and had not transferred to a new clinic. ART, antiretroviral therapy; IQR, interquartile range.

Table 2

Reasons given for dropping out of care: univariate proportions and counts by order of magnitude ($N = 430$).

	Yes	
Item	***N***	**%**
I felt well and thought I didn't need care	136	32
Transportation was difficult or expensive	128	30
Work interfered with picking up meds or visiting clinic	103	24
I had family obligations	74	17
I didn't have enough money to access care	59	14
Seeking cure by prayer/religious rituals, or I saw/am seeing a traditional healer instead	54	13
Attending clinic risked disclosure that I had HIV	51	12
Afraid the clinic would scold me for missing appointments	43	10
Attending clinic risked disclosure to my family that I had HIV	43	10
I spent too much time at the clinic	34	8
Work interfered with taking medications	32	7
I did not want to take drugs forever	29	7
Patient moved (coded from responses in open text fields)	25	6
The medicine was not helping me feel better, or I was experiencing side-effects from the medicine	24	6
A family member/important person told me to stop going	20	5
The staff was not nice	14	3
I didn't have enough food	12	3

Percentages shown are the proportion of total respondents who answered ‘yes’ to a given reason for dropping out of care;responses were not mutually exclusive. A total of 14 variables on reasons for dropping out of care with 10 or fewer ‘yes’ responses were not shown.

Table 3

Geomin rotated factor loadings in exploratory and confirmatory factor analyses (*N* = 430).

Response item	**EFA**	**CFA**	**95% confidence interval (for CFA)**	
Factor 1: poverty				
Transportation was difficult or expensive	1.009	0.841	0.576	1.105
I didn't have enough money to access care	0.865	0.998	0.712	1.283
I didn't have enough food[a]	0.412	0.378	0.175	0.581
Factor 2: inconvenience/work interference				
Work interfered with picking up medications or visiting clinic	1.015	0.992	0.528	1.457
Work interfered with taking medications	0.526	0.521	0.240	0.803
Factor 3: poor treatment/quality of care at clinic				
I spent too much time at the clinic	0.653	0.705	0.412	0.998
The staff was not nice	0.875	0.500	0.143	0.857
Afraid the clinic would scold me for missing appointments	0.425	0.552	0.291	0.813
Factor 4: fear of disclosure of HIV status				
Attending clinic risked disclosure to my family that I had HIV	0.875	0.995	0.457	1.533
Attending clinic risked disclosure that I had HIV	0.945	0.830	0.376	1.284
Factor 5: healthy family provider/migrant				
I felt well and thought I didn't need care	0.382	0.265	0.055	0.475
Patient moved (recoded from open text fields)	0.612	0.472	0.185	0.760
I had family obligations	0.593	0.769	0.376	1.163
Factor 6: treatment fatigue/seeking spiritual healing				
family member/important person told me to stop going	0.398	0.599	0.350	0.849
I didn't want to take drugs forever	0.913	0.634	0.421	0.847
The medicine was not helping me feel better, or I was experiencing side-effects from the medicine	0.606	0.450	0.202	0.698
Seeking cure by prayer/religious rituals, or I saw/am seeing a traditional healer instead	0.652	0.996	0.756	1.237

In EFA the geomin rotated loadings are standardized regression coefficients of each item regressed onto a given factor while controlling for the other factors. All factor loadings for EFA statistically significant at 5% level. Results of tests of goodness of fit for the six-factor EFA solution shown in this table: χ^2 test of model fit (*P*) = 0.814. RMSEA = 0.00; CFI = 1.00; SRMR = 0.059. Goodness-of-fit test results for CFA: χ^2 test of model fit (*P*) = 0.133. RMSEA = 0.019; CFI = 0.970; WRMR = 0.858. CFA, confirmatory factor analyse; EFA, exploratory factor analyses.

[a] The item loaded highly (0.443) but nonsignificantly on factor 3, poor treatment/quality of care at clinic.

Table 4

Factors for reasons for disengagement: associations with subsequent reengagement.

Cox proportional hazards model	Hazard ratio	95% Confidence interval	*P* value
Model 1: poverty	1.47	1.13–1.91	0.004
ART status (reference: on ART)			
Eligible but not on ART	0.15	0.05–0.50	0.002
Not eligible (high $CD4^+$)	0.32	0.17–0.61	0.000
$CD4^+$ cell count	0.99	0.95–1.05	0.877
Age	1.00	0.98–1.03	0.770
Sex – male (reference: female)	1.22	0.73–2.02	0.453
Model 2: inconvenience/work interference	0.96	0.73–1.25	0.749
Poverty	1.42	1.11–1.82	0.006
ART program site (reference: AMPATH, Kenya)			
FACES, Kenya	3.14	0.98–10.01	0.053
IDI, Uganda	0.59	0.13–2.65	0.489
NACP, Tanzania	1.30	0.36–4.69	0.687
Model 3: poor treatment/quality of care at clinic	1.39	1.14–1.71	0.001
Poverty	1.37	1.07–1.75	0.013
ART program site (reference: AMPATH, Kenya)			
FACES, Kenya	3.15	0.99–10.02	0.052
IDI, Uganda	0.59	0.13–2.64	0.485
NACP, Tanzania	1.41	0.39–5.07	0.597
Model 4: fear of disclosure of HIV status	0.82	0.62–1.08	0.166
Age	1.01	0.99–1.03	0.254
Sex	1.27	0.85–1.88	0.240
Model 5: healthy family provider/ migrant	1.09	0.75–1.59	0.640
ART status (reference: on ART)			
Eligible but not on ART	0.15	0.05–0.48	0.001
Not eligible (high $CD4^+$)	0.34	0.18–0.63	0.001
$CD4^+$ cell count	0.99	0.94–1.04	0.685
Model 6: treatment fatigue/seeking spiritual healing	0.70	0.48–1.02	0.065
ART status (reference: on ART)			
Eligible but not on ART	0.13	0.04–0.42	0.001
Not eligible (high $CD4^+$)	0.26	0.16–0.43	0.000
Fear of disclosure of HIV status	0.76	0.57–1.01	0.063
Poor treatment/Quality of care at clinic	1.46	1.18–1.81	0.000
Inconvenience/work interference	0.94	0.72–1.24	0.670

The table depicts association of barriers (categorized by factor analysis) on the rate of return to care in multivariable Cox proportional hazards models. Each model required different sets of adjustment variables for estimating the total effect of the factor on reengagement. AMPATH, Academic Model Providing Access to Healthcare; ART, antiretroviral therapy; FACES, Family AIDS Care and Education Services; IDI, Infectious Diseases Institute; NACP, National AIDS Control Program.