

This policy brief is drawn from: Calvin Chiu, Mead Over, Gesine Meyer-Rath, Frank Tanser, Deenan Pillay, Till Bärnighausen, Jacob Bor. Distance elasticity of demand for HIV treatment: sex disparities in utilisation. Presented at the 2016 International AIDS Conference and IAEN Pre-Conference, Durban, South Africa. Presentation can be viewed here: <https://www.heard.org.za/wp-content/uploads/2016/06/Distance-elasticity-of-demand-for-HIV-treatment.pdf>

DOES DISTANCE TO CLINIC AFFECT UTILIZATION OF HIV CARE AND TREATMENT SERVICES?

Background

The location of HIV treatment services may be an important determinant of access to care. Understanding the relationship between distance to clinic and utilization has implications for the placement of new facilities as well as for interventions designed to overcome distance barriers, e.g., transport vouchers, community-based drug delivery, and reduction in required visits.¹ Distance imposes both financial and time costs. A study in rural KwaZulu-Natal, South Africa, found that HIV treatment patients spend an average of 39 Rand and 2.2 hours per month getting to the clinic.²

We assessed the association between distance to the nearest HIV clinic and progression through several stages of the HIV cascade of care: linkage to care, starting antiretroviral therapy (ART), and retention in care.³ Our analysis focused on three questions (**Fig 1**): to what extent does distance modify care-seeking? At what point in the cascade do gaps emerge? And how do these patterns vary by sex? Our hypothesis – based on a simple model of care-seeking – was that distance to clinic would be a more significant barrier to care-seeking earlier in the cascade when the benefits of care-seeking are more uncertain, because people may not yet know their HIV status nor have information about ART.

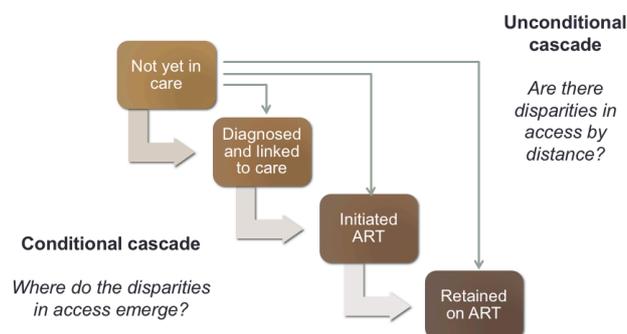


Fig 1. Does distance affect HIV care-seeking?

Methods

We conducted a prospective cohort study of adults residing in the health and demographic surveillance area maintained by the Africa Health Research Institute (AHRI, www.ahri.org) in rural KwaZulu-Natal, South Africa. AHRI conducts repeat

household surveys on a population of about 100 thousand people who are members of households in a 438 km² geographically defined surveillance area in Hlabisa sub-district.⁴ The area is nearly 100% isiZulu-speaking, largely rural and quite poor. About one in three adults is HIV-infected. The data are linked at the individual level with patient records from the Hlabisa sub-district public sector HIV care and treatment programme.⁵

Distance to the nearest clinic was calculated based on the geocoded locations of households and clinic coordinates. Date of linkage to care was estimated using date of first CD4 count; dates of ART initiation were obtained from clinical charts; and 12-month retention in care was defined as any CD4 count or viral load 6-18 months after starting ART.⁶ The study population included all adults residing in the demographic surveillance on December 31, 2006, chosen because linkage to care data was only available from January 2007 on. Follow-up was through December 31 2013.

We assessed the association between distance to the nearest clinic and progression through the care cascade using Cox proportional hazards models. We estimated models of the form $h(t|X) = h_0(t)\exp(X\beta)$, where the X covariates included age, age-squared, HIV prevalence at the local level, socio-economic characteristics, and distance to clinic. Models were stratified by sex.

We assessed progression through the cascade in two ways (**Fig 1**). First, we assessed time from a fixed baseline date (Dec 31 2006) to each step in the cascade – time from baseline to linkage, time from baseline to ART start, time from baseline to 12-month retention on ART. We call this approach “unconditional” because the same denominator is used for each step of the cascade. Second, we assessed time from each step of the cascade to the next step of the cascade, “conditional” on reaching that stage, e.g. “time from linkage to ART conditional on linkage”. Although the conditional perspective is the more common view of the care cascade, changes in the composition of the sample at each stage can bias associations. As shown in **Fig 1**, these approaches answer different questions.

Results

Our analysis included 29,547 adults contributing 126,984 person-years. Of these, 3383 linked to care, 2189 started ART, and 1718 were retained on ART at 12 months. The population was 41% male, with a median age of 35 years. Among those who had been linked to care, only 26% were male. Median distance to the nearest clinic was 2.6 km in the full population and 2.3 km among those who were linked to care.

The percent of the total adult population who had linked to HIV care, initiated ART, and remained on ART for 12 months was lower among people residing further from health facilities (Fig 2).

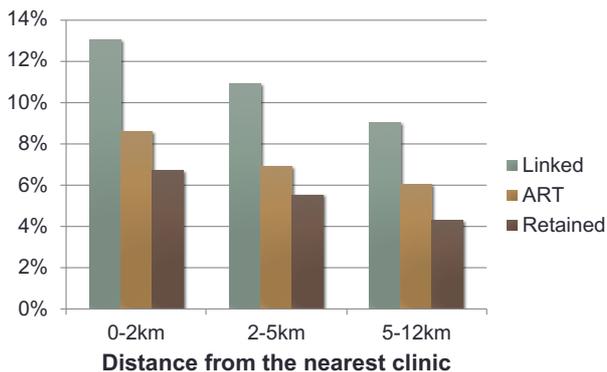


Fig 2. Percent of the total adult population linked to care, initiated on ART, and retained in HIV treatment

Among women, each additional kilometer to the nearest clinic was associated with a 6.6% (95%CI 4.9%, 8.3%) reduction in the rate of linkage to care, a 6.5% (95%CI 4.2%, 8.7%) reduction in the rate of ART initiation, and a 5.4% (95%CI 3.4%, 7.4%) reduction in rate of retention on ART (Fig 3). However, no significant associations were observed between distance and progression to the latter stages of the cascade *conditional* on linkage. No significant associations were observed between distance and care-seeking for men (Fig 4).

A limitation of the study was the potential for bias due to non-response in the HIV surveillance.

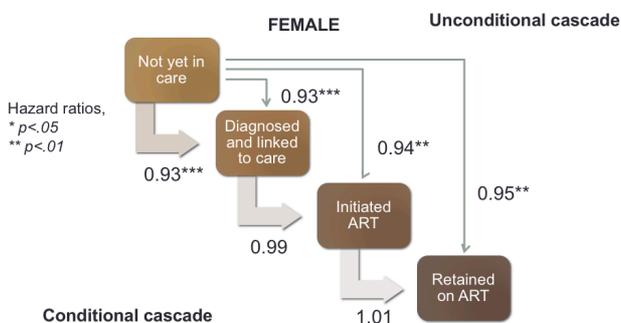


Fig 3. Distance to clinic and care-seeking among women: hazard ratios from Cox models

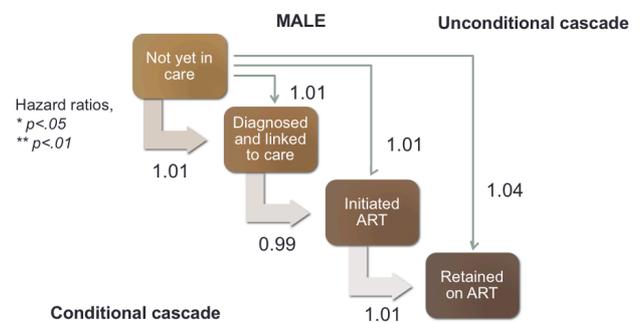


Fig 4. Distance to clinic and care-seeking among women: hazard ratios from Cox models

Conclusions and Policy Relevance

We assessed the relationship between distance to clinic and progression through the HIV care cascade. We have two key findings. First, distance matters, but only for women. We found no relationship between distance and care-seeking for men. Further work is needed to understand whether women face constraints to mobility not faced by men. Second, for women, distance affected linkage to care, but was not associated with later transitions in the care cascade. It is possible that distance is a less important barrier once people find out their HIV status, learn about treatment, and overcome the hurdle of their first clinic visit.

South Africa has set a goal of increasing utilization of HIV treatment services. Distance may be a significant barrier to treatment uptake and retention. Our findings show that distance is important but may matter most at the initial decision to seek care. Efforts are needed to address linkage barriers for women living far from clinics. However, interventions to address distance are unlikely to increase care-seeking among men. Other approaches are needed.

References

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