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Disclosure History Among Persons Initiating Antiretroviral Treatment at Six HIV Clinics in Oromia, Ethiopia, 2012–2013

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Abstract

HIV status disclosure can help patients obtain support which may influence treatment adherence and subsequent healthcare needs. We examined the extent of disclosure and correlates of non-disclosure among 1180 adults newly initiating antiretroviral treatment (ART). While 91 % of those in a relationship shared their status with their partners, 14 % of the overall sample had not disclosed to anyone. Non-disclosure was positively associated with older age; control over household resources; and concerns about unintended disclosure, life disruptions, and family reactions. Knowing other HIV-positive people and longer time since diagnosis were associated with lower odds of non-disclosure. Most respondents reporting disclosure experienced supportive responses, frequently including decision to get an HIV test by confidants who had not known their own status. Although HIV status disclosure prior to ART initiation was high, some individuals cited concerns about unintended disclosure, gossip, and partner violence, and may benefit from additional disclosure support.

Keywords

HIV disclosure; HIV-positive adults; HIV/AIDS; Antiretroviral treatment initiation; Ethiopia

Introduction

Disclosure of one's HIV positive status facilitates access to care and treatment for patients and their sexual partners, benefits the community by promoting openness about HIV, and is

therefore key to curbing the HIV epidemic [1]. However, disclosure is a complex process that involves knowledge, motivations, and choices influenced by socio-cultural norms and assessment of associated risks and benefits. The decision whether to disclose, to whom, and when, depends on patient's readiness to take a perceived risk [2, 3]. As a result, the level of disclosure of HIV positive status varies geographically and among different patient populations. Indeed, a review of 17 studies on disclosure among women in Africa and Asia found disclosure rates ascertained at varying time points following diagnosis ranging from 17 to 86 % [4].

Research in Ethiopia has documented that disclosure of HIV positive status is common in the general population of patients receiving HIV services (76–95 %) [5–8], with slightly lower levels of disclosure to sex partners (57–93 %) [5–12]. Knowledge of partner's HIV status, prior communication about HIV testing, pre-test counseling, advanced disease stage, being married, and longer time since diagnosis were found to be important facilitators of disclosure [6–10, 12].

Disclosure prior to initiating antiretroviral therapy (ART) is of particular importance, as it may influence timing of treatment initiation, subsequent adherence to treatment and patient outcomes in several ways [13, 14]. It may improve the patient's psychological well-being and the support they can count on for keeping drugs at home and taking them daily, following dietary and lifestyle modifications required for specific medications, as well as discussion and management of side effects [15–17]. However, to date, no data on the extent of disclosure specifically as of the time of ART initiation are available in Ethiopia or other regions.

With an estimated 760,000 people living with HIV (PLWH) and adult prevalence of 1.3 % [18, 19], Ethiopia began scaling up comprehensive HIV services, including ART, in 2005, and adopted a family-centered approach to HIV prevention, treatment, care and support in order to curb the primarily heterosexually transmitted disease affecting families. Disclosure of HIV positive status to partners and other family members is a central pillar of this approach [20].

The aim of this study was thus to assess the extent of disclosure of HIV positive status and correlates of nondisclosure at the time of ART initiation. Additionally, we aimed to compare actual disclosure experiences with stigma anticipated by patients in the event of HIV status disclosure. Assessment of disclosure-related patient perceptions and experiences in a setting where disclosure is highly encouraged will help generate evidence for the design of appropriate interventions and improvements to clinic-based counseling.

Methods

Study Setting

The six study sites are HIV clinics in the Oromia regional state of Ethiopia, and part of the Ethiopian National ART Program, overseen by the Oromia Regional Health Bureau. All sites are secondary health facilities in urban areas, with on-site CD4 testing capability and ART pharmacies. All offer onsite voluntary counseling and testing, perform provider

initiated counseling and testing, and have an antenatal clinic, labor and delivery wards providing Prevention of Mother to Child Transmission (PMTCT) services. All of the clinics are open Monday to Friday for HIV care services, and four of the six are open seven days per week. All clinics offer adherence support for ART and pre-ART patients through adherence supporters and case managers.

Enrollment and Data Collection

Data collection consisted of structured patient interviews and abstraction of routine clinical information collected at patient visits.

Patient Interviews—All outpatients aged 18 years and older initiating ART at the six study clinics during June 2012–April 2013 were eligible for inclusion in the study. Eligible patients were referred by providers, given more information about the study and invited by study staff to participate on the day of ART initiation. Interested patients were screened for eligibility and requested to sign an informed consent form. Upon receipt of informed consent, study staff, who fluently spoke the two local languages, administered the 45–60 min structured questionnaire in Amharic or Oromiffa language as per participant preference. The questionnaire covered topics such as socio-demographics, HIV knowledge, HIV testing and care experience, HIV status disclosure, HIV beliefs, stigma, emotional health, and sexual history. Patients unable to complete the interview right away had up to 2 weeks to do so. Upon completion, participants were given a snack and money for transportation home from the clinic (20 birr ~1 USD).

Routine Clinical Information—Patient information routinely collected at enrollment in HIV care and during subsequent clinic visits (e.g. CD4 counts, disease stages, weight) was documented by clinicians on structured national forms. Trained data clerks entered the baseline and follow-up clinic visit information into electronic databases. Data quality assessments were done every 3 months to assess completeness, accuracy and paper-electronic data concordance.

Data Management—Interview data were double entered in a Microsoft Access database developed for the study and were linked with the de-identified clinic medical record data abstracted from patient-level electronic database for the period of HIV care enrollment through 12 months after ART initiation. The study was approved by the Institutional Review Boards of the Oromia Regional State Health Bureau, Columbia University Medical Center, and the City University of New York.

Outcome Definition

Disclosure was defined as sharing one's HIV positive status with an individual other than clinic staff member (i.e. a health care provider, adherence counselor or case manager) at any point following diagnosis but prior to the date of ART initiation. Information on disclosure and its extent was obtained through two questions: (1) how many people, other than health care workers, participants had told their HIV status to; and (2) whether they had disclosed to specific persons such as their partner, parent, sibling, child, another relative, or friend.

Correlate Definitions

Patient Interviews—To identify possible associations between non-disclosure and fears about the consequences of sharing one's HIV status, we examined the intensity of concern about unintended disclosure, as well as the number of concerns across categories of anticipated stigma, with items ($\alpha = 0.764$) created in accordance with the concept described by Earnshaw and Chaudoir [21]. These items were later divided into four areas, based on principal component analysis: concerns about major life disruptions (loss of job or housing), partner's reaction (violence, abandonment), impact on children (abuse, upset), and social implications and family reactions (different treatment by family, loss of friends, gossip, anxiety, negative impact on social relations). Impact on children was not used in this analysis, not to exclude participants who did not have children. We examined patients' social environment, possibly reflecting the opportunity and/or support for disclosure, as knowing other PLWH, number of close friends, participation in a community group (dichotomized into traditionally close-knit groups, such as village committees and burial societies, and all others, for example credit or trade groups), control over household assets, as well as relationship status and having ever had children.

To explore possible associations with motivation for HIV testing and/or counseling differences between different types of testing sites, we also included unit/clinic of diagnosis: provider-initiated testing and counseling (PITC) and voluntary counseling and testing (VCT).

Reactions to disclosure were recorded separately for first person disclosed to and for partner (if not the first person), through a list of 13 yes/no items.

The earliest available diagnosis date (from self-report during interview and patient's medical record) was used to compute the time between diagnosis and ART initiation.

Routine Clinical Information—Severity of illness at enrollment was based on the earliest CD4 and World Health Organization (WHO) stage measurements during the first three months in HIV care. For analysis, the variable was dichotomized into advanced disease (WHO stage III, IV, or $CD4 < 150$) and less advanced disease (WHO stage I or II).

Statistical Methods

We conducted gender-stratified descriptive analyses, comparing the distribution of key characteristics between male and female participants using χ^2 and Mann–Whitney tests of statistical significance ($p < 0.05$). We further examined bivariate associations with non-disclosure through logistic regression, also using $p < 0.05$ as the level of statistical significance. To identify potential correlates of non-disclosure to anyone and to partner specifically, we developed two logistic regression models to estimate adjusted odds ratios (aOR). Multivariable regression models initially included age, gender and other variables that had p values < 0.20 in bivariate analyses. Covariates with the highest p values were eliminated through backward stepwise regression until all remaining variables had p values < 0.05 . To rule out the possibility of negative confounding (i.e. associations observed only in the presence of other variables), excluded variables were added individually back into the

model and retained if their p value was <0.05 . Analyses were conducted in SAS 9.3 (Cary, NC) using generalized linear models (PROC GENMOD) with a logit link and generalized estimating equations to account for clustering of observations within clinical sites.

Results

Participant Characteristics

We interviewed 1182 patients initiating ART at the six study sites. After excluding 2 for being underage, the final dataset for this analysis comprised 1180 respondents. The mean age of participants was 34 years, interquartile range (IQR) 28–40. There were more female (61.2 %) than male (38.8 %) respondents, over two thirds (69.9 %) were Ethiopian Orthodox followers, 60.4 % had attended primary or secondary school, 57.0 % were in a relationship, and 78.0 % were urban residents. The median length of time since diagnosis was 8.3 months (IQR 1.1 months–3.4 years). (Table 1)

Levels of HIV Status Disclosure by Type of Confidant

Overall, 85.9 % of study participants disclosed their HIV status to at least one person prior to ART initiation. Although disclosure was high among both gender groups, female participants were more likely to disclose to anyone as compared to males (males 81.2 %, females 88.8 %, $p < 0.001$). Among 686 participants currently or previously in a relationship, 91.1 % disclosed their HIV status to their partners. Despite a lower overall disclosure rate, male participants were more likely than women to disclose their HIV status to their partner (males 94.1 %, females 88.9 %, $p = 0.018$). Over half (53.5 %) of respondents disclosed their HIV status to a family member other than their partner (males 46.5 %, females 57.9 %, $p < 0.001$). Over 50 % of respondents disclosed to two or more people (males 46.3 %, females 52.5 %, $p = 0.001$), whereas 14.1 % told no one (Table 2)

Factors Associated with Non-disclosure to Anyone

In the multivariable regression model, non-disclosure of HIV positive status to anyone prior to ART initiation was associated with not being in a relationship (aOR 2.84, 95 % CI 1.83–4.39), control over household assets (aOR 3.10, 95 % CI 2.15–4.48), and a strong concern about unintended disclosure (aOR 2.80, 95 % CI 1.72–4.57). An association was also observed between major disruption concerns and non-disclosure (1 concern vs. 0 aOR 1.54, 95 % CI 1.08–2.19; 2 vs. 0 aOR 2.08, 95 % CI 1.23–3.53). Factors associated with lower odds of non-disclosure were female gender (aOR 0.41, 95 % CI 0.33–0.52), having ever had children (aOR 0.55, 95 % CI 0.30–0.99), knowing other PLWH (aOR 0.36, 95 % CI 0.31–0.43), having three or more close friends (aOR 0.36, 95 % CI 0.18–0.73) and a longer period between HIV diagnosis and ART initiation (31 days–1 year vs. 30 days aOR 0.52, 95 % CI 0.36–0.76) (Table 3).

Factors Associated with Non-disclosure to Partner

Non-disclosure of HIV status to one's partner prior to ART initiation was strongly associated with female gender (aOR 4.03, 95 % CI 2.22–7.31), older age (40–44 vs. 25–29, aOR 1.92, 95 % CI 1.64–2.26; 45+ vs. 25–29 aOR 2.64, 95 % CI 1.54–4.51), secondary education (vs. none, aOR 1.68, 95 % CI 1.09–2.59), concern about social implications and

family reactions (3–5 concerns vs. 0 aOR 3.63, 95 % CI 1.81–7.27), control over household assets (aOR 4.73, 95 % CI 2.76–8.10), and advanced stage HIV disease at enrollment in care (aOR 3.26, 95 % CI 1.76–6.04). Patients who knew other PLWH (aOR 0.21, 95 % CI 0.11–0.38), members of close-knit social groups (aOR 0.36, 95 % CI 0.15–0.91), and those with a longer time period since HIV diagnosis (31 days–1 year vs. 30 days aOR 0.62, 95 % CI 0.43–0.89) were less likely to withhold their HIV status from their partners (Table 3).

Reactions Upon Disclosure to First Person and Partner

Upon disclosure to the first confidant, 85.6 % of participants were encouraged to get treatment. About a third (30.9 %) were told not to tell anyone (males 26.1 %, females 33.8 %, $p < 0.05$), and 10.5 % said the first confidants became angry (males 17.5 %, females 6.4 %, $p < 0.001$). Upon disclosure to partner, the majority of participants received a supportive response: 82.2 % were encouraged to get treatment. Over three quarters (78.0 %) of participants reported that their partner decided to get tested for HIV if they didn't already know their status (males 84.7 %, females 70.0 %, $p < 0.001$). Almost two thirds (62.8 %) of participants reported their partner was sad (males 72.4 %, females 55.2 %, $p < 0.001$). Additionally, 28.6 % (males 32.6 %, females 25.4 %, $p < 0.05$) reported their partner blamed them and 13.0 % (males 20.8 %, females 6.9 %, $p < 0.001$) stated that their partner was angry at them (Table 4).

Anticipated Stigma: Concerns of Patients Who Did Not Disclose to Anyone

Among the 167 (14.1 %) participants who had not disclosed their status to anyone, main concerns included unintended disclosure by confidant (73.9 %) and gossip (68.7 %). Participants who did not disclose also feared partner violence (63.3 %), abandonment by partner (54.2 %), upsetting their children (58.9 %), and child abuse or discrimination (52.3 %) in the event of HIV status disclosure (Table 5).

Discussion

This study examined the extent of disclosure of HIV positive status prior to ART initiation overall and by type of confidant, and factors associated with non-disclosure among patients initiating ART at 6 clinical sites in Oromia regional state, Ethiopia. The level of reported HIV status disclosure in our study was high, at 86 % overall and 91 % to partner, among those currently or previously in a relationship. The overall disclosure level we found was slightly lower than that reported by some studies among patients in HIV care in Ethiopia (76–95 %) [5–7]. However, disclosure to partner in our sample was generally higher than that reported elsewhere in the country (57–93 %) [5–7, 9–11]. The proportion disclosing to partner among those reporting a relationship was higher than the overall disclosure level in our sample, which may reflect the emphasis on disclosure to partner as a key component of family-centered ART preparatory counseling at the study clinics [20].

We found that knowing other PLWH and a longer period of time between HIV diagnosis and ART initiation were associated with lower odds of non-disclosure to partner and overall, in agreement with other studies in similar settings [7, 22]. This could be because some patients need to decide to whom and when to disclose, carefully weighing the risks and benefits of

their choice. As they live longer with the infection, they might have more opportunities to meet PLWH who can share their experiences and support them on the path to disclosure [23].

Although women in our study were overall less likely than men to withhold their HIV status, they were more likely not to tell their partner, specifically. Although gender-specific disclosure levels to partner vary by context, studies in the region have found that women may fear blame of bringing HIV into the family and abandonment in the event of status disclosure to partner [7, 11, 23]. Some women may therefore need additional, culturally sensitive support to facilitate disclosure to partner, or counseling on the risks versus benefits of non-disclosure.

This study has also identified asset control as a predictor of non-disclosure, which is in agreement with previous reports of anticipation of economic support as a factor motivating disclosure [24–27]. Persons who consider themselves as in charge of household assets or household itself may not perceive a great need for additional support, or may fear losing their position in the household if their HIV-positive status is revealed. The association with asset control may also encompass employment, previously found to decrease the odds of disclosure, perhaps due to fear of workplace repercussions [28].

Odds of non-disclosure to partner were higher among participants who enrolled in HIV care at an advanced stage of HIV, which is contrary to results reported by Deribe [6] and counterintuitive, because noticeable signs of disease may make it harder to keep illness secret. Patients physically weakened by disease, however, may be more vulnerable in the possible event of a negative reaction to disclosure, which may affect their perception of risk and benefit: the fear of losing existing social support may outweigh the desire for additional support which could result from disclosure. Some patients with advanced HIV at enrollment in care may have also delayed HIV testing and/ or accessing care, perhaps due to similar stigma-related concerns that appear to underlie non-disclosure. Additionally, debilitating symptoms may be a barrier to open communication with partners, which could be mediated by psychological distress associated with physical illness and the stress of sharing a diagnosis that may affect the partner. Odds of non-disclosure to partner also were consistently higher among participants older than 40, perhaps due to fear of blame for bringing sexually transmitted disease to the family; a finding which merits further in-depth inquiry. Prior research from Sub-Saharan Africa reported inconsistent associations between age and HIV status disclosure (higher likelihood of disclosure among older [29, 30] and younger [4, 31] persons), but our results suggest that older patients could benefit from tailored interventions in support of HIV status disclosure to partners.

However, odds of non-disclosure to partner were lower among those reporting membership in close-knit social groups. Among factors possibly mitigating disclosure-related stress and concerns, community groups relying on mutual trust (such as village or burial committees) may help provide social support beneficial in the process of HIV status disclosure. This is consistent with our finding that non-disclosure overall was less likely among patients who had three or more close friends, underlining the importance of social network in disclosure.

Finally, concerns ranging from reactions of the loved ones to unintended disclosure underscore patients' need of control over the disclosure process and support across various settings where PLWH may encounter stigma or discrimination. Overall, reported disclosure experiences were largely positive; participants felt they were encouraged to get treatment by 86 % of first persons and by 82 % of partners they confided in. Supportive experience in our study was more common than described in Ethiopia by Gari and Seid [7, 11]. However, some participants faced non-supportive reactions including blame, anger, and being asked not to share their status further. Pervasive fear and reports of non-supportive experiences upon disclosure indicate a need to identify patients who could benefit from personalized support to minimize negative reception and cope with reactions that might otherwise compromise their care and health outcomes. While it is encouraging that only a fraction of those who have disclosed their HIV status faced serious consequences such as physical violence, loss of housing or children (less than 1 % each), persons who still haven't disclosed their HIV status and report such fears may be those at highest risk of negative reactions.

Importantly, timely disclosure appears to have facilitated partner decision to undergo HIV testing, which has the potential effect of resulting in earlier HIV diagnosis among partners than would have occurred without disclosure. Partners of persons with HIV are more likely to be HIV positive themselves, and therefore, disclosure can have a potential public health effect of earlier diagnosis and more timely treatment initiation, potentially reducing onward spread of HIV. Additionally, partners who test negative can provide an indication for earlier HIV treatment of the index patient, which has been shown to reduce transmission by 96 % in serodiscordant couples [32].

The major strength of this study comes from the time of assessment of HIV status disclosure (ART initiation), a period during the HIV care continuum when disclosure is of great importance, as it may impact patients' subsequent engagement and success in treatment. The care procedures and environment in which the study was conducted are similar to other HIV care and treatment settings across Ethiopia, allowing the results of this study to inform future interventions and programmatic planning in the region.

However, there may have been a social desirability bias due to the fact that participants were interviewed on the premises of the care and treatment facility where they went through ART preparatory sessions that strongly encourage patients to disclose their HIV status as a critical step to build treatment support and initiate family-centered care. We also did not capture the information on the reason for disclosure, when and how it happened, as well as possible differences in initial and follow-up reactions to disclosure. Since our study was focused on a segment of PLWH (those with clinical HIV care experience in an urban setting) at a specific point in the HIV care cascade (ART initiation), estimates of disclosure rates cannot be generalized to the general HIV infected population.

Conclusions

Our findings revealed high levels of HIV status disclosure, with 86 % of respondents reporting disclosure to anyone and 91 % of those currently/previously in relationships

reporting disclosure to their partners. Though women were overall less likely not to tell anyone about their HIV status than men, they had higher odds of not disclosing to partner, and may need targeted support in this respect. Patients 40 years of age and older, those who enrolled with advanced HIV and those initiating treatment soon after diagnosis may benefit from additional help to disclose their status to people in their lives who can offer support. Concerns about life disruptions, social reactions, and potentially about diminished role in household were barriers to disclosure and should be addressed during ART preparatory and follow-up counseling sessions. Though HIV status disclosure experiences in our study were largely positive, some patients also faced a negative reception. Presence of such reactions necessitates continued policy emphasis on fostering greater social support for PLWH and, on the clinic level, a personalized counseling approach to support patients to disclose in a way that minimizes negative reactions and provides coping skills for various life contexts in which negative consequences may occur. Future research should examine the effect of time-updated disclosure status on outcomes following ART initiation, such as care engagement, medication adherence, and retention in HIV care.

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Table 1

Characteristics of patients initiating ART at 6 Ethiopian clinics (June 2012–April 2013)

	Total		% disclosed		Men		Women		<i>p</i> value ^a
	N	%			N	%	N	%	
Total	1180	100	85.8		458	38.8	722	61.2	
Site (n = 1180)									
Ambo	241	20.4	88.0		109	23.8	132	18.3	0.028
Bishoftu hospital	309	26.2	85.4		133	29.0	176	24.4	
Fiche hospital	166	14.1	83.7		53	11.6	113	15.7	
Goba hospital	129	10.9	79.1		45	9.8	84	11.6	
Nekemte hospital	194	16.4	86.6		70	15.3	124	17.2	
Shashemene hospital	141	11.9	90.8		48	10.5	93	12.9	
Age (n = 1180)									
<i>Median (IQR)</i>	34 (28–40)				37 (32–43)		30 (26–38)		<0.001
18–24	118	10.0	84.8		15	3.3	103	14.3	<0.001
25–29	256	21.7	88.3		63	13.8	193	26.7	
30–34	224	19.0	88.8		76	16.6	148	20.5	
35–39	258	21.9	85.3		129	28.2	129	17.9	
40–44	140	11.9	85.7		71	15.5	69	9.6	
45+	184	15.6	80.4		104	22.7	80	11.1	
Religion (n = 1180)									
Ethiopian orthodox	825	69.9	85.2		323	70.5	502	69.5	0.549
Protestant	239	20.3	87.9		85	18.6	154	21.3	
Muslim	108	9.2	85.2		47	10.3	61	8.4	
Other	8	0.7	100.0		3	0.7	5	0.7	
Highest education level attended (n = 1180)									
No school	374	31.7	85.3		92	20.1	282	39.1	<0.001
Primary school	473	40.1	87.5		200	43.7	273	37.8	
Secondary school	239	20.3	82.4		111	24.2	128	17.7	
University	83	7.0	89.2		49	10.7	34	4.7	
Vocational/other	11	0.9	81.8		6	1.3	5	0.7	

	Total		% disclosed	Men		Women		<i>p</i> value ^a
	N	%		N	%	N	%	
Current relationship status (n = 1180)								
In a relationship	673	57.0	92.9	309	67.5	364	50.4	<0.001
Not in a relationship	507	43.0	76.5	149	32.5	358	49.6	
Residence (n = 1179)								
Rural	259	22.0	84.2	122	26.7	137	19.0	0.002
Urban	920	78.0	86.4	335	73.3	585	81.0	
Median time between diagnosis and ART initiation (IQR)								
	8.3 months (1.1 months–3.4 years)			3.6 months (27 days–2.4 years)		1.1 years (1.2 months–4.0 years)		<0.001

^a χ^2 test (categorical variables) or Mann–Whitney *U* test (continuous variables)

^a χ^2 test (categorical variables) or Mann–Whitney *U* test (continuous variables)

Table 2

Proportion of participants who disclosed their HIV status, by type of confidant

	Total		Men		Women		p value
	N	%	N (%)	N (%)	N (%)	N (%)	
Disclosure to anyone (n = 1180)							
Yes	1013	85.9 %	372 (81.2 %)	641 (88.8 %)		<0.001	
No	167	14.1 %	86 (18.8 %)	81 (11.2 %)			
Disclosure to partner (n = 686)							
Yes	625	91.1 %	272 (94.1 %)	353 (88.9 %)		0.018	
No	61	8.9 %	17 (5.9 %)	44 (11.1 %)			
Disclosure to any family member other than partner ^a (n = 1180)							
Yes	631	53.5 %	213 (46.5 %)	418 (57.9 %)		<0.001	
No	549	46.5 %	245 (53.5 %)	304 (42.1 %)			
Disclosure to a parent (n = 1001)							
Yes	219	21.9 %	72 (19.6 %)	147 (23.2 %)		0.177	
No	782	78.1 %	296 (80.4 %)	486 (76.8 %)			
Disclosure to a sibling (n = 988)							
Yes	406	41.2 %	150 (41.2 %)	256 (41.0 %)		0.955	
No	582	58.8 %	214 (58.8 %)	368 (59.0 %)			
Disclosure to children (n = 804)							
Yes	187	23.3 %	48 (16.5 %)	139 (27.1 %)		<0.001	
No	617	76.7 %	243 (83.5 %)	374 (72.9 %)			
Disclosure to friend (n = 1002)							
Yes	266	26.6 %	95 (25.8 %)	171 (27.0 %)		0.689	
No	736	73.4 %	273 (74.2 %)	463 (73.0 %)			
Number of people disclosed to (n = 1180)							
0	167	14.1 %	86 (18.8 %)	81 (11.2 %)		0.001	
1	422	35.8 %	160 (34.9 %)	262 (36.3 %)			
2-3	282	23.9 %	93 (20.3 %)	189 (26.2 %)			
4-9	188	15.9 %	77 (16.8 %)	111 (15.4 %)			
10 or more	121	10.3 %	42 (9.2 %)	79 (10.9 %)			

$\beta_{\text{Parent, sibling, child, or another relative}}$

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Table 3
Bivariate and multivariable associations between respondents' characteristics, non-disclosure to anyone, and non-disclosure to partner

	Bivariate		Multivariable		
	N	Non-disclosure to anyone OR (95 % CI)	N	Non-disclosure to partner OR (95 % CI)	Non-disclosure to partner (N = 656) aOR (95 % CI)
Sociodemographic factors					
Gender					
Men	458	Ref	289	Ref	Ref
Women	722	0.55 (0.42–0.71)	396	1.93 (1.27–2.92)	4.03 (2.22–7.31)
Age at ART initiation					
18–24	118	1.36 (0.64–2.88)	64	1.97 (0.83–4.69)	2.43 (0.80–7.37)
25–29	256	Ref	163	Ref	Ref
30–34	224	0.95 (0.51–1.76)	137	1.97 (0.98–3.93)	2.21 (1.02–1.76)
35–39	258	1.30 (0.76–2.23)	153	0.67 (0.36–1.23)	0.80 (0.32–2.03)
40–44	140	1.26 (0.79–1.99)	77	1.39 (0.69–2.83)	1.92 (1.64–2.26)
45+	184	1.83 (1.09–3.09)	91	1.71 (0.92–3.20)	2.64 (1.54–1.51)
Highest education level					
No school	374	Ref	211	Ref	Ref
Primary school	473	0.83 (0.51–1.35)	288	0.57 (0.42–0.76)	0.78 (0.57–1.07)
Secondary school	239	1.23 (0.87–1.74)	123	1.26 (0.81–1.95)	1.68 (1.09–2.59)
University	83	0.71 (0.37–1.36)	56	1.09 (0.43–2.73)	1.62 (0.71–3.69)
Vocational/other	11	1.30 (0.37–4.48)	7	1.51 (0.59–3.83)	14.72 (3.78–57.36)
Area of residence					
Urban area	920	0.83 (0.72–0.95)	519	1.27 (0.76–2.14)	
Rural area	259	Ref	166	Ref	
Relationship status					
In a relationship	673	Ref		Ref	
Not in a relationship	507	3.99 (2.14–7.41)		2.84 (1.83–4.39)	
Has ever had children					
Yes	926	0.47 (0.34–0.66)	581	0.55 (0.25–1.21)	0.55 (0.30–0.99)
No	253	Ref	104	Ref	Ref

	Bivariate			Multivariable		
	N	Non-disclosure to anyone (95 % CI)	OR (95 % CI)	N	Non-disclosure to partner (95 % CI)	Non-disclosure to anyone (N = 1163) aOR (95 % CI)
Anticipated stigma						
Concern about unintended disclosure						
None	511	Ref		316	Ref	Ref
Slight	290	1.49 (0.95–2.33)		170	1.16 (0.77–1.77)	1.10 (0.61–1.99)
Strong	376	3.27 (2.37–4.51)		198	1.32 (0.59–2.95)	2.80 (1.72–4.57)
Number of concerns about major disruptions						
0	957	Ref		583	Ref	Ref
1	148	1.82 (1.19–2.76)		78	0.91 (0.72–1.15)	1.54 (1.08–2.19)
2	75	3.52 (2.49–1.97)		32	0.80 (0.24–2.63)	2.08 (1.23–3.53)
Number of concerns about partner's reaction						
0				249	Ref	Ref
1				300	1.78 (1.12–2.85)	1.33 (0.51–3.44)
2				136	2.79 (1.06–7.34)	2.43 (0.83–7.14)
Number of concerns about social implications and family reactions						
0	386	Ref		249	Ref	Ref
1–2	532	1.13 (0.54–2.33)		300	0.95 (0.71–1.27)	0.87 (0.58–1.32)
3–5	262	1.98 (1.01–3.88)		136	1.81 (1.38–2.37)	1.82 (1.11–2.99)
Social environment						
Knows other PLWH						
Yes	850	0.28 (0.19–0.40)		557	0.20 (0.13–0.30)	0.36 (0.31–0.43)
No	330	Ref		128	Ref	Ref
Number of close friends						
None	370	Ref		182	Ref	Ref
1–2	509	0.54 (0.36–0.82)		311	1.09 (0.68–1.75)	0.61 (0.35–1.06)
3 or more	297	0.36 (0.19–0.68)		191	0.84 (0.44–1.61)	0.36 (0.18–0.73)
Belongs to a community group						
Close social group	702	0.55 (0.45–0.68)		468	0.41 (0.18–0.93)	0.36 (0.15–0.91)

	Bivariate			Multivariable		
	N	Non-disclosure to anyone (N = 656) OR (95 % CI)	N	Non-disclosure to partner OR (95 % CI)	Non-disclosure to anyone (N = 1163) aOR (95 % CI)	Non-disclosure to partner (N = 656) aOR (95 % CI)
(burial society, neighborhood committee)						
Another community group	81	0.60 (0.31–1.16)	48	0.89 (0.52–1.53)		1.17 (0.60–2.29)
None	397	Ref	169	Ref		Ref
Who has control over household assets						
Respondent	664	4.71 (2.95–7.50)	277	2.59 (1.71–3.93)	3.10 (2.15–4.48)	4.73 (2.76–8.10)
Another family member	510	Ref	405	Ref	Ref	Ref
Circumstances of diagnosis						
Severity of illness at enrollment						
Less advanced (WHO stage I or II)	600	Ref	386	Ref		Ref
Advanced (WHO stage III, IV, or CD4 < 150)	545	1.78 (1.23–2.56)	275	2.45 (1.69–3.53)		3.26 (1.76–6.04)
Unit/clinic where diagnosed						
PITC	653	Ref	369	Ref		
VCT	513	0.68 (0.47–1.00)	310	0.85 (0.48–1.51)		
Time between diagnosis and ART initiation						
<30 days	274	Ref	143	Ref	Ref	Ref
31 days–1 year	364	0.66 (0.45–0.96)	197	0.69 (0.46–1.04)	0.52 (0.36–0.76)	0.62 (0.43–0.89)
1 year–2.5 years	209	0.44 (0.20–0.97)	129	0.35 (0.12–0.99)	0.46 (0.20–1.09)	0.44 (0.16–1.19)
>2.5 years	333	0.31 (0.16–0.62)	216	0.39 (0.17–0.88)	0.46 (0.21–1.01)	0.57 (0.21–1.55)

Accounting for site-level clustering

Statistically significant associations in bold

Table 4

Reactions to disclosure by partner and by first person disclosed to

	First person disclosed to ^a				Partner								
	N	n (%)	total	n (%)	male participants	n (%)	female participants	N	n (%)	total	n (%)	male participants	n (%)
Encouraged respondent to get treatment	1011	865 (85.6 %)	312 (84.1 %)	553 (86.4 %)	613	504 (82.2 %)	221 (82.5 %)	283 (82.0 %)					
Decided to get tested for HIV (if didn't know status)	702	288 (41.0 %)	138 (54.1 %)	150 (33.6 %)	350	273 (78.0 %)	144 (84.7 %)	129 (70.0 %)					
Comforted respondent	727	613 (84.3 %)	209 (82.0 %)	404 (85.6 %)	437	328 (75.1 %)	134 (74.9 %)	194 (75.2 %)					
Became very sad	1010	681 (67.4 %)	265 (71.4 %)	416 (65.1 %)	612	384 (62.8 %)	194 (72.4 %)	190 (55.2 %)					
Told respondent not to tell anyone else	1012	313 (30.9 %)	97 (26.1 %)	216 (33.8 %)	614	197 (32.1 %)	80 (29.7 %)	117 (33.9 %)					
Blamed you	1013	295 (29.1 %)	117 (31.5 %)	178 (27.8 %)	620	177 (28.6 %)	88 (32.6 %)	89 (25.4 %)					
Became angry	1012	106 (10.5 %)	65 (17.5 %)	41 (6.4 %)	614	80 (13.0 %)	56 (20.8 %)	24 (6.9 %)					
Refused to have sex					607	68 (11.2 %)	35 (13.1 %)	33 (9.7 %)					
Took another partner					604	24 (4.0 %)	11 (4.1 %)	13 (3.9 %)					
Moved out of the house	918	12 (1.3 %)	10 (2.9 %)	2 (0.4 %)	598	16 (2.7 %)	12 (4.6 %)	4 (1.2 %)					

Making respondent move out, beating respondent, and taking children away reported by less than 1 % of respondents. Statistically significant differences (χ^2 test) by gender in bold^aFirst person disclosed to: partner (52.8 %), sibling (18.3 %), child (7.1 %), friend (7.1 %), parent (6.8 %)

Table 5

Anticipated stigma: concerns reported by patients who have not disclosed to anyone

	N	Frequency	%
Unintended disclosure by confidant	165	122	73.9
Gossip	166	114	68.7
Partner violence	49	31	63.3
Upset children	107	63	58.9
Abandonment by partner	48	26	54.2
Child abuse/discrimination	107	56	52.3
Different treatment by family	166	69	41.6
Loss of friends	165	63	38.2
Loss of employment	166	44	26.5
Loss of housing	166	33	19.9
Concern for others	166	32	19.3