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Predictors of HIV-1 serostatus disclosure: a prospective study among HIV-infected pregnant women in Dar es Salaam, Tanzania

Gretchen Antelman^a, Mary C. Smith Fawzi^b, Sylvia Kaaya^c, Jessie Mbwambo^c, Gernard I. Msamanga^d, David J. Hunter^e, and Wafaie W. Fawzi^{a,e}

^aDepartment of Nutrition, Harvard School of Public Health, Boston, Massachusetts, USA.

^bDepartment of Social Medicine, Harvard Medical School, Boston, Massachusetts, USA.

^cDepartment of Psychiatry, Muhimbili University College of Health Sciences, Dar es Salaam, Tanzania.

^dDepartment of Community Health, Muhimbili University College of Health Sciences, Dar es Salaam, Tanzania.

^eDepartment of Epidemiology, Harvard School of Public Health, Boston, Massachusetts, USA.

Abstract

Objectives: To examine the socio-demographic and behavioral factors predictive of women's disclosure of an HIV-positive test result in Dar es Salaam, Tanzania.

Design: From April 1995 to May 2000, 1078 HIV-positive pregnant women participated in an ongoing randomized trial on micronutrients and HIV-1 vertical transmission and progression. Disclosure to a partner or to a female relative was assessed 2 months after post-test counseling and at 6 monthly follow-up visits. Socio-demographic, health, behavioral and psychological factors were measured at baseline and during follow-up.

Methods: Predictors of time to disclosure of HIV serostatus were determined using Cox proportional hazards regression models.

Results: Prevalence of disclosure to a partner ranged from 22% within 2 months to 40% after nearly 4 years. Women were less likely to disclose to their partners if they were cohabiting, had low wage employment, had previously disclosed to a female relative, or reported ever-use of a modern contraceptive method. Women reporting fewer than six lifetime sexual partners or knowing someone with HIV/AIDS were more likely to disclose to their partners. Disclosure to a female relative was predicted by knowing more than two individuals with HIV/AIDS, full economic dependency on their partner, high levels of social support, and prior attendance at a support group meeting.

Conclusions: A substantial proportion of HIV-infected pregnant women never disclosed their result to a partner or a close female relative. Lack of disclosure may have limited their ability to

engage in preventive behaviors or to obtain the necessary emotional support for coping with their serostatus or illness.

Keywords

HIV; counseling; notification; disclosure; women; pregnancy; Tanzania

Introduction

Disclosure of a positive HIV test result may present significant risks to women due to the stigmatization of HIV infection and the low social and economic status of women [1–3]. However, with the recently documented efficacy of cost-effective antiretroviral regimens [4–6], many developing countries are beginning to implement programs to prevent perinatal transmission. In addition to providing HIV counseling and testing in the antenatal setting, these programs offer treatment with anti-retroviral drugs, delivery at a referral hospital, and special counseling on infant feeding. For the vast majority of women in Tanzania, the support of a partner and key family members would be an important factor in determining whether a woman is able to fully participate in, and benefit from such interventions.

There are other potential benefits of disclosure, both to the community and the individual. Contact tracing and notification of persons at risk of exposure to a sexually transmitted infection is a fundamental public health principle. However, barriers to effective implementation of such policies in sub-Saharan Africa include stigmatization of HIV infection, poor access to treatment, uncertainties about the timing of infection and number of partners who could have been exposed, and shortages of trained personnel in the health and social services sectors [7].

The quality of support a woman receives from her partner, family and community following disclosure could be directly related to the woman's own psychological and physical well-being [1]. In Thailand, higher levels of HIV-related worry occurred among women who did not disclose their serostatus [8]. Having good psychological health is possibly independently related to HIV disease progression [9]; inadequate social support has been associated with increased rates of depression [10].

Women who disclose may also receive more appropriate health care. Family members are key decisionmakers with regard to facilitating access to medical treatment and in providing palliative care. Decisions may be better informed if HIV infection is accepted among family members and openly discussed with health care providers.

In populations representing predominantly homosexual men in the United States, disclosure has been associated with time since notification of result, development of illness symptoms, and fewer sexual partners [11,12]. Steady partners or spouses are most likely to be informed of a positive HIV test result, followed by mothers and sisters. Male relatives and casual partners are the least likely to be informed [11].

A study of women in New York found that disclosure was related to having a steady partner, younger age, and higher levels of social support [13]. However, the temporal relationship

between social support and disclosure is difficult to interpret in this cross-sectional study as disclosure could have been associated with the perception of higher levels of social support.

There is very little research on the factors related to disclosure of HIV status among women in Africa. A recent report from Kenya found that partner notification of serostatus among HIV-infected pregnant women was significantly associated with marriage, young age, and low socio-economic status [14]. In a study from Thailand, HIV-infected women were asked who they would choose as the future care-provider of their children and nearly every woman (98%) had considered who would care for her children after her death, but only 37% had actually disclosed their HIV status to the potential future child care-provider [15].

Among studies reporting the prevalence of disclosure, there is wide variability depending on serostatus, gender, and population group. In central Africa, nearly universal intention to disclose to partners among seronegative women (94%) was reported, compared to far lower willingness to disclose among seropositive women (47%) [16]. However, studies of actual disclosure rates among those who test seropositive reveal far lower estimates than studies of intention to disclose. Data from two studies in Kenya found disclosure rates among women ranging from 27% (time since notification not stated) [17] to 37% within 1 year of notification [18]. In a recent Tanzanian prevention of mother-to-child transmission trial, only 17% of the women shared their result with their partner [19].

Little is known about the characteristics of seropositive women who choose to disclose their test result. This paper examines the independent effects of demographic characteristics and behavioral predictors on disclosure to a partner or a female relative over time. We also examined reasons for non-disclosure among those who never disclosed.

Materials and methods

Subjects and design

From April 1995 to July 1997, 1078 HIV-infected women were enrolled in a randomized controlled double-blind clinical trial designed to examine the effect of vitamin supplementation on perinatal HIV transmission and progression of disease [20]. Pregnant women were screened for HIV infection after an individual pre-test counseling session was conducted by a trained nurse counselor at four antenatal clinics in Dar es Salaam, Tanzania. Women who consented to be tested were given an appointment to return to the same counselor 1 week later for post-test counseling. Women who were eligible for the study were escorted to the study clinic for an introduction to the study staff. These women were given an appointment 1 week later for randomization. Consenting HIV-infected women who were at less than 27 weeks of gestation were followed monthly at Muhimbili Medical Centre, the major teaching and referral hospital in Dar es Salaam.

Data collection

A baseline questionnaire was administered to obtain information about socio-demographic status. At the second monthly visit, information on pregnancy, medical history, contraceptive use and number of sexual partners was assessed. Data were collected on psychosocial status and HIV-related events at the third monthly visit and at six monthly intervals. These data

included whether disclosure had occurred since the last assessment, to whom the woman had disclosed, and the number of HIV-infected people the woman knows. At these assessments, all non-disclosing women were asked to describe their reasons for not sharing their HIV test result. Psychosocial measures included depression and anxiety symptoms using the 25-item Hopkins Symptom Checklist (HSCL-25) [21] and perceived level of social support [22]. If a woman missed a scheduled appointment for a psychosocial interview, her assessment was carried out at the next visit 4 weeks later or as soon as she reported to the clinic.

The HSCL-25 includes the 10-item anxiety and 15-item depression sub-scales [23]. Internal consistency of the depression subscale has been reported at 0.86 [21] and the instrument has high stability of depression and anxiety scores over time [24]. In primary care settings, the instrument has been demonstrated to show high concordance (87%) between 'case' assessment by a physician and the patient's own rating of distress [23].

The perceived social support scale is based on the Duke-UNC Functional Social Support Questionnaire that was designed to measure functional elements of social support of patients in a primary care setting. A 10-item questionnaire was derived from this scale that reflects emotional/affective support and material/instrumental support (see Appendix A for scale items and scoring). Test-retest reliability has been reported to be 0.66 and the scale has been shown to have positive correlations with other social support measures [22].

Two outcome variables measuring disclosure were defined and treated separately in all analyses: disclosure to a sexual partner and disclosure to a female relative. Women who disclosed to both targets were included in both analyses.

Statistical methods

Risk factors examined included socio-demographic variables such as age, educational level, occupation, marital status, level of economic dependency on others, daily household expenditure on food, and partner's educational level and occupation. Other variables were number of lifetime sexual partners, history of a sexually transmitted infection in the last 5 years, a woman's reported history of having sex with someone other than a primary partner in the past year, ever-use of a condom, ever-use of a modern contraceptive method (e.g. pill, intra-uterine device, injectable, but not including condoms), number of people known with HIV/AIDS, and CD4+ lymphocyte count at randomization. Psychosocial factors included depression and anxiety scores, perceived level of social support, and prior disclosure to either a partner or female relative. Data from interviews conducted from April 1995 until May 2000 were included in this analysis.

Cox proportional hazards models were used to examine the predictors of time to disclosure [25]. Variables with a univariate *P*-value of 0.20 or less were introduced into multivariate proportional models (SAS/STAT, Version 6.12, SAS Institute, Cary, North Carolina, USA). Variables were retained in the final adjusted models if they had a *P*-value of 0.10 or less, or if they materially affected the estimates of the other variables in the model.

Follow-up time was calculated in days since post-test counseling until event/loss censoring. Women who never disclosed were censored at the date of their latest available assessment.

The time to each disclosure event was calculated as the number of days from post-test counseling to a defined date of disclosure, where this date of disclosure was either the midpoint between the date of post-test counseling and the first report of disclosure after 2 months, or the midpoint between the most proximate prior assessment where the woman had reported not disclosing and the next assessment where disclosure was first reported. The midpoint between two assessments was used because we did not ask women to recall the exact date of disclosure.

For the purpose of calculating disclosure prevalence rates over time, all observations were assigned to follow-up intervals in which an observation could appear only once in each interval. These intervals are best described by their medians: The 'baseline' assessment occurred before delivery and 2 months after post-test counseling and all subsequent intervals were centered around 7, 12, 18, 24, 30, 35, 41, and 46 months since post-test counseling.

Human subjects

The study was approved by the College Research and Publications Committee of Muhimbili University College of Health Sciences, the Ethical Committee of the National AIDS Control Program of the Tanzanian Ministry of Health, and the Institutional Review Board of the Harvard School of Public Health.

Results

Description of study participants

Data from women with at least one assessment of disclosure status were included in this analysis ($n = 999$). We did not observe all women in each time interval (2 months after post-test counseling: $n = 815$; 7 months: $n = 757$; 12 months: $n = 658$; > 12 months: $n = 730$) for several reasons including early delivery, moving out of the study area, temporary absence from the study, death, or not reaching the visit due date before the data were 'frozen' for this analysis. The total follow-up time was 1.9 years per person.

Women who were not assessed during any time interval after 12 months were largely similar to those who remained under follow-up. There were no differences in the overall prevalence of immediate disclosure to a partner or female relative, in age, occupation, duration of marriage/partnership, marital status, partner's occupation, level of economic dependence on others, number of reported sexual partners, CD4+ count and knowing someone with HIV/AIDS. However, women who were followed for less than 12 months did have a slightly lower mean number of years of education (3.7 compared to 3.8 years; $P = 0.01$) and had lower mean scores on the depression scale (1.14 compared to 1.19, $P = 0.04$).

The median age of the women in the sample was 24 years, and median gestational age at post-test counseling was 20 weeks. About one-third (34%) were primiparous; 47% had one or two prior births and 19% had three or more children (Table 1). The majority (76%) of the women had completed 5–8 years of primary education and were not employed outside the home (73%). Over one-half (58%) of the women reported being in a monogamous marriage; 25% were cohabiting. Three-quarters (75%) reported full economic dependency on others.

At enrollment over 80% of the study group was asymptomatic in WHO clinical stage I, 18% were classified as stage II and less than 1% were in stage III of HIV disease. At the first follow-up assessment of disclosure and psychosocial status, 7.2% of the women scored above the cut-off for depressive symptoms (> 1.75). Over 95% of the women reported not knowing anyone with HIV/AIDS.

Figure 1 presents the cross-sectional prevalence of disclosure to a partner, female relative, or both at each time interval. Disclosure to a partner increased from 22% at the first follow-up visit to 40% nearly 4 years after post-test counseling. In comparison with disclosing to a partner, the rate of early disclosure to a female relative was significantly lower ($\chi^2_{1 \text{ d.f.}} = 19.1; P < 0.0001$), but increased to 36%, approaching the proportion who reported partner disclosure over the same period of time (NS). The initial prevalence rate of disclosure to both a partner and female relative was only 3%, but increased to 18% after nearly 4 years of follow-up. Women who disclosed to a female relative at any time ($n = 305$) were most likely to disclose to their mother (59%), followed by their sister (46%), and other female relatives (29%).

Over one-half of all women who disclosed to a partner did so within the first 2 months. Excluding these 'early' disclosers, the incidence rate of new disclosures to a partner per 100 person-years was 11.8 between 2 and 7 months after post-test counseling; 4.1 between 7 and 12 months and 3.0 between 13 and 18 months. Rates of new partner disclosures dropped to less than 1.0 per 100 person-years after 18 months. The incidence of disclosure to a female relative followed the same pattern of decreasing rapidly after 7 months (15.6 between 2 and 7 months; 4.8 between 7 and 12 months; 3.2 between 13 and 18 months) and declining to rates between 1 and 2 per 100 person-years between 18 and 35 months. However, starting at about 3 years after post-test counseling, there was a statistically significant increase in the rate of disclosure to a female relative (3.0 per 100 person-years between 35 and 41 months; 3.2 per 100 person-years between 41 and 46 months) that was not observed in disclosure to partners.

Disclosure to a partner

In the multivariate proportional hazards regression analyses several characteristics were found to be predictive of disclosure to a partner (Table 2). Women who were monogomously married for less than 2 years or cohabiting for 2 or more years were nearly 40% less likely to disclose to their partner compared with women who were monogomously married for 2 or more years (monogomous marriage < 2 years: relative risk (RR), 0.62; 95% confidence interval (CI), 0.46–0.85; cohabiting 2+ years: RR, 0.62; 95% CI, 0.41–0.94). Women cohabiting for less than 2 years were 69% less likely to disclose to their partner (RR, 0.31; 95% CI, 0.21–0.81) and women in a polygamous marriage were 59% less likely to disclose to their partner (RR, 0.41; 95% CI, 0.26–2.65).

The occupation of the women was also a significant predictor of partner disclosure. Women working in a restaurant, bar or hotel, or having other low-wage employment were 72% less likely to disclose to a partner in comparison with women who did not work outside the home (RR, 0.28; 95% CI, 0.11–0.67). In comparison with women who reported having six or more

lifetime sexual partners, women reporting fewer partners were more likely to disclose (2 to 5 lifetime partners: RR, 1.54; 95% CI, 1.05–2.27; one partner: RR, 2.41; 95% CI, 1.48–3.92).

Over twice as many of the women who reported knowing someone with HIV/AIDS disclosed to their partners in comparison with those who reported not knowing anyone with HIV (RR, 2.28; 95% CI, 1.36–3.82). Women who had previously disclosed to a female relative were less likely to disclose to their partners (RR, 0.62; 95% CI, 0.46–0.84), as were women who had reported ever-use of any modern contraceptive method (RR, 0.76; 95% CI, 0.57–1.01). There was a marginally significant ($P=0.08$) association between lower daily expenditure on food, a proxy for low socio-economic status, and partner disclosure (RR, 1.48; 95% CI, 0.95–2.30).

Disclosure to a female relative

Women in partnerships of less than 2 years were less likely to disclose to a female relative (RR, 0.65; 95% CI, 0.50–0.85), although the type of marital relationship was not associated with female relative disclosure (Table 3). Full economic dependence on others was associated with a 42% increase in the rate of disclosure to a female relative (RR, 1.42; 95% CI, 1.04–1.93). Knowing two or more people with HIV/AIDS was strongly associated with disclosure to a female relative compared with not knowing others with HIV/AIDS (RR, 3.63; 95% CI, 1.91–6.89). Higher reported levels of social support were associated with increased rates of disclosure to a female relative (RR, 1.61; 95% CI, 1.04–2.50), as was prior attendance at weekly study-sponsored voluntary self-help group meetings (RR, 1.75; 95% CI, 1.17–2.59). Prior disclosure to a partner, as well as occupation, education, and partners' socio-demographic characteristics were unrelated to female relative disclosure.

Reasons for non-disclosure

Among those women who never disclosed their test results to anyone ($n=490$), the reasons given for non-disclosure were fear of losing confidentiality (32%), fear of social isolation (14%), not wanting to worry others (17%), and fear of conflict with partner (15%) defined as verbal or physical abuse or fear of separation/divorce), and being 'just afraid' (11%). The distribution of reasons given for non-disclosure by women who delayed disclosure but eventually did share their result did not differ from the distribution of reasons given by women who never disclosed.

Discussion

Studies of disclosure among a self-selected group of individuals who seek voluntary counseling and testing generally provide higher estimates of disclosure in comparison with studies of antenatal clinic attendees. Nearly 70% of non-pregnant HIV-infected women who attended a voluntary counseling and testing in Dar es Salaam disclosed their serostatus to a partner [26]. Yet in our sample only 40% chose to share their HIV serostatus even after a considerable follow-up time. A large part of the difference in observed disclosure rates is likely to be due to the factors motivating consent for HIV testing. In the voluntary counseling and testing population, prior communication with a partner and/or family members about HIV risk is more likely to have occurred.

There may also be the increased social vulnerability of pregnant and nursing women. Although the reasons women gave for their non-disclosure were coded broadly in this study, they centered around fear of losing confidentiality ('if I tell ... the news will spread all over'), fear of separation or divorce, or conflict with partner ('... I will miss love and be abandoned'), social isolation from family or community, or mistreatment during times of illness ('there is no cure for this virus. If you tell your relatives the news, even if you become sick with a normal disease, they will not treat you ... they will think you are dying'), and not wanting to worry others ('I am afraid to tell my parents ... they both have high blood pressure').

The type and duration of the relationship between the woman and her partner were major determinants of disclosure. Women who had been married for less than 2 years and those in a cohabiting relationship (of any duration) were less likely to disclose to their partners in comparison with women who had been married for 2 years or longer. A similar association between duration of a woman's marital/cohabiting relationship and female relative disclosure was also observed.

Women may be considering how their relationships are perceived by family or community members. Women in newer or non-marital partnerships may feel more vulnerable to accusations of infidelity or being infected before beginning their current partnership ('... my husband will chase me away... he will say it is me who brought HIV to him'). This interpretation is consistent with another study from central Africa where 86% of women chose not to disclose their serostatus due to fears of being accused of infidelity [16]. The findings that partner disclosure was positively associated fewer lifetime sexual partners, and was inversely associated with being employed in low-wage jobs outside the home including commonly stigmatized work within a hotel, bar or restaurant also support this interpretation.

Knowing someone with HIV/AIDS predicted disclosure to both a partner and a female relative. Personally knowing a person living with HIV/AIDS may help to reduce the stigma of the disease by dispelling myths associated with HIV infection, improving understanding of the needs of a person living with HIV/AIDS, and increasing empathy.

There was an observed association between ever-use of modern contraception (oral pill, intra-uterine device or injection) and lower rates of disclosure to a partner. One explanation may be that women feel that their partners and/or the community will associate modern contraceptive use with behaviors that are not socially prescribed for women, such as the desire to limit or space childbirth, or sexual promiscuity [27]. A recent study from Uganda reported that partner opposition to contraception resulted in higher unmet need for contraception overall, and a shift away from modern methods to more traditional methods of contraception [28].

An association between economic vulnerability of women and risk of HIV-infection has been well established in a variety of cultural settings and countries with different levels of development and different scales of economic disparity [29]. Within this paradigm, increased economic choices and/or access to resources would logically predict HIV serostatus disclosure. However, this hypothesis was not supported by our findings and is also

not supported by a recent report from Kenya which found that women of lower socio-economic status (SES) were more likely to disclose [14].

Our data showed that women with lower daily expenditures on food, a proxy for socio-economic status, were more likely to disclose to a partner. Women who were completely dependent on others for economic support, which was associated with lower daily expenditure on food (data not shown), were more likely to disclose to a female relative. Further, there was no positive association observed between disclosure and higher educational status or earning potential (defined by having work outside the home).

In explaining this finding, it is helpful to note that our study population was predominantly of low socio-economic status; they were recruited at publicly funded health clinics which are mandated to provide free services. It is possible that we were unable to detect an association that actually exists between socio-economic status and disclosure due to lack of variability within our study sample. Alternatively, there may be other psychological or social factors related to decision-making and approaches to problem-solving that further explain differences in disclosure rates among women of low socio-economic status.

Women who are dependent on other individuals (e.g. partner, family members) for economic support may also be more likely to defer primary responsibility for social and psychological support to members of their kin group. In many settings, decisions around disclosure may represent a more traditional approach to problem-solving, characterized by family members being ultimately responsible for mediating conflicts, providing emotional support, and caring for those who are ill. This hypothesis requires further elaboration through studies of womens' decision-making, feelings of personal efficacy, and relative comfort with fully accepting the implications of being told of one's HIV serostatus on an individual level. It is interesting to note that the environment of voluntary counseling and testing encourages privacy, confidentiality and taking individual responsibility. Many women may be uncomfortable making the transition from first learning their HIV serostatus in the voluntary counseling and testing environment to finding effective and culturally appropriate coping mechanisms within their families and communities.

The relatively low proportion of women who disclosed both to a partner and a female relative suggests considerable stress around issues of disclosure. Women who disclosed to a female relative were less likely to subsequently disclose to their partners. Is this because women who disclosed to a female relative received the support they felt they needed? Another explanation may be that women who want to disclose but are reluctant to tell their partner feel their only alternative is to disclose to a female relative.

The predictors of disclosure to a female relative were largely similar to those predicting disclosure to a partner, namely, being in a partnership of a relatively longer duration (> 2 years), knowing someone with HIV/AIDS, and having low socio-economic status. However, important differences in predictors of female relative disclosure compared to the partner disclosure model were related to the efficacy of support networks.

Women who reported having adequate levels of social support were more likely to disclose to a female relative than women who reported having lower levels of social support. The

person to whom the woman disclosed her serostatus was likely to be one of the primary providers of instrumental and emotional support. Other studies on how women cope with HIV infection over time have observed positive associations between disclosure and social support [13,30], and negative associations between disclosure and HIV-related worry [8].

Women who attended study-sponsored weekly self-help group meetings were also more likely to share their test result with a female relative. Measures of group meeting attendance were taken from assessments prior to disclosure in this analysis, however, we cannot rule out the possibility that women who had already decided to disclose to a female relative may have chosen to come to the support group first to discuss the issue. Even if this did occur, we may still conclude that social support groups were useful in helping women work through issues of disclosure and this is consistent with research showing that ongoing counseling interventions are beneficial in assisting HIV-infected persons with the psychologically stressful task of deciding to disclose and then coping with the effects of disclosure [31].

Programs that provide counseling and testing in the antenatal setting in order to identify HIV-infected women eligible for mother-to-child transmission interventions are likely to have to confront low disclosure rates as a potential barrier to compliance with the recommended treatment and risk reduction behaviors. The process of voluntary counseling and testing and receiving an HIV test result is necessarily an individual process, yet pregnancy itself may propel a woman even deeper into a culturally prescribed role as a wife and mother. Her ensuing disclosure behavior may be shaped by her special status during pregnancy.

The findings of our study point to many possible areas for further intervention research which should combine qualitative and quantitative methods. Increasing male-involvement in perinatal care, community-based awareness/behavior change campaigns, and supportive counseling would be promising approaches to increasing rates of serostatus disclosure. Prior to evidence from such studies, a first step for mother-to-child transmission programs would be to provide resources for training and staffing to ensure that adequate ongoing support and counseling is available to women who have already learned their serostatus within a voluntary counseling and testing component of mother-to-child transmission programs.

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Appendix A

Social support scale

Emotional/affective support items include:

- (1) I get visits from friends and relatives;
- (2) I get useful advice about important things in my life;
- (3) I get chances to talk to someone about problems at work or with my housework;
- (4) I get chances to talk to someone I trust about my personal and family problems;
- (5) I have people who care what happens to me; and
- (6) I get love and affection.

Material/instrumental support items include:

- (7) I get help around the house;
- (8) I get help with money in an emergency;
- (9) I get help when I need transportation; and
- (10) I get help when I am sick.

All items are scored on a four-point scale where: 4 = as much as I would like; 3 = less than I would like; 2 = much less than I would like; and 1 = never. A mean score of < 3 across all 10 items was coded as 'low social support'.

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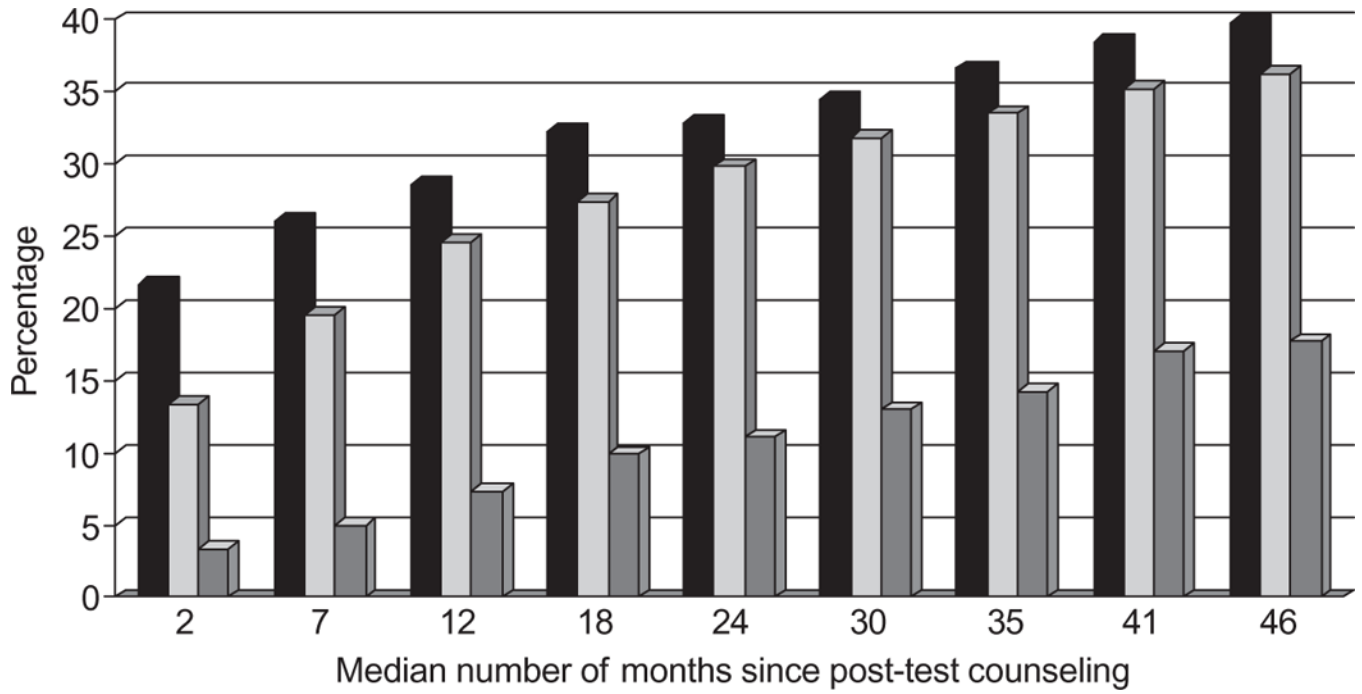


Fig. 1. Prevalence of disclosure of an HIV-positive test result to a partner (black shading), female relative (light gray shading) or both (dark gray shading) over time, n = 999.

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Table 1.Description of 999 HIV-positive pregnant women in Dar es Salaam^a.

	n (%)
Education	
none or ≤ 4 years	135 (14%)
5–8 years	761 (76%)
≥ 9 years	103 (10%)
Occupation	
no outside employment	730 (73%)
professional	26 (3%)
business	139 (14%)
office	41 (4%)
public house/other	63 (6%)
Duration of current partnership	
< 2 years	509 (57%)
≥ 2 years	379 (43%)
Marital status	
married monogomously	581 (58%)
married polygamously	56 (6%)
cohabiting	252 (25%)
single	110 (11%)
Prior births	
none	330 (34%)
1–2	465 (47%)
≥ 3	184 (19%)
Financial dependency on others	
no	248 (25%)
yes	750 (75%)
Attended support group	
no	863 (87%)
yes	136 (14%)
Partner's education	
≤ 4 years	36 (4%)
5–8 years	557 (68%)
≥ 9 years	227 (28%)
Partner's occupation	
business	302 (35%)
professional	49 (6%)
military	72 (8%)
public house	28 (3%)
driver	64 (7%)
long distance driver	29 (4%)

	n (%)
low wage/odd jobs/day laborer	316 (37%)
Number of lifetime sexual partners	
1	86 (10%)
2	181 (20%)
3	227 (25%)
4–5	234 (26%)
≥ 6	170 (19%)
Had an STI in past 5 years	
no	818 (82%)
yes	181 (18%)
Ever-use of modern contraception ^b	
no	676 (69%)
yes	310 (31%)
Ever-use of a condom	
no	539 (55%)
yes	447 (45%)
Had sex outside of partnership in last year	
no	806 (81%)
yes	193 (19%)

^aSome women had missing (or not applicable) values for some characteristics. The denominator included only those with non-missing values.

^bIncludes oral contraception, injectable and intra-uterine device. STI, sexually transmitted infection.

Table 2.

Predictors of disclosure of an HIV-positive test result to a partner^a.

	n (%) disclosed to partner	Univariate RR (95% CI) ^b	P-value	Multivariate RR (95% CI) ^c	P-value
Marital status and duration					
married ≥ 2 years	161 (45%)	1.0		1.0	
married < 2 years	76 (34%)	0.75 (0.57–0.98)	0.035	0.62 (0.46–0.85)	0.003
cohabiting ≥ 2 years	34 (30%)	0.58 (0.40–0.84)	0.004	0.62 (0.41–0.94)	0.025
cohabiting < 2 years	23 (17%)	0.31 (0.20–0.48)	0.0001	0.31 (0.19–0.50)	0.0001
polygamously married (any duration)	11 (20%)	0.36 (0.20–0.66)	0.001	0.41 (0.21–0.81)	0.010
no steady partner	4 (36%)	0.67 (0.25–1.81)	0.43	0.83 (0.26–2.65)	0.76
Woman's occupation					
in home	251 (34%)	1.0		1.0	
professional	10 (38%)	0.98 (0.52–1.85)	0.96	1.22 (0.53–2.78)	0.64
business	45 (32%)	0.86 (0.63–1.19)	0.37	0.95 (0.65–1.38)	0.78
office	11 (27%)	0.68 (0.37–1.24)	0.21	0.73 (0.37–1.43)	0.36
public house/other	7 (11%)	0.29 (0.14–0.62)	0.001	0.28 (0.11–0.67)	0.005
Woman's no. of lifetime sexual partners					
1	44 (51%)	3.13 (2.01–4.87)	0.0001	2.41 (1.48–3.92)	0.0004
2–5	208 (32%)	1.61 (1.13–2.30)	0.008	1.54 (1.05–2.27)	0.028
≥ 6	36 (21%)	1.0		1.0	
Knows someone with HIV/AIDS ^d					
no	304 (32%)	1.0		1.0	
yes	20 (51%)	1.58 (1.00–2.48)	0.049	2.28 (1.36–3.82)	0.002
Prior disclosure to a female relative ^d					
no	250 (34%)	1.0		1.0	
yes	74 (29%)	0.72 (0.55–0.93)	0.012	0.62 (0.46–0.84)	0.002
Ever-use of modern Contraception					
no	230 (34%)	1.0		1.0	
yes	91 (29%)	0.79 (0.62–1.00)	0.052	0.76 (0.57–1.01)	0.055
Daily expenditure on food (Tsh) ^e					

	n (%) disclosed to partner	Univariate RR (95% CI)^b	P-value	Multivariate RR (95% CI)^c	P-value
< 2500	274 (34%)	1.42 (0.94–2.13)	0.095	1.48 (0.95–2.30)	0.08
≥ 2500	25 (26%)	1.0		1.0	

^aAll predictor variables in this model were assessed prior to HIV testing and counseling, except the number of people known with HIV/AIDS, and status of disclosure to a female relative.

^bEstimates obtained from univariate Cox proportional hazards regression models, using dummy variables to represent each category (except the reference).

^cEstimates obtained from a single multivariate Cox proportional hazards regression model including all variables shown in this table (using dummy variables as in univariate modelling).

^dThe number of people known with HIV/AIDS and disclosure to a female relative were assessed at each follow-up assessment of disclosure. Thus, for observations counted as ‘events’ (disclosure), these measures were taken from the assessment done at the time when disclosure was first reported. For women who never disclosed to a partner, these measures were taken from the latest available assessment.

^eUS dollar \$1 = approximately 600–650 Tanzanian Shilling during the time of this study.

RR, relative risk; CI, confidence interval.

Table 3.

Predictors of disclosure of an HIV-positive test result to a female relative.

	n (% disclosed to partner)	Univariate RR (95% CI) ^a	P-value	Multivariate RR (95% CI) ^b	P-value
Years in marriage/partnership					
≥ 2	175 (34%)	1.0		1.0	
< 2	91 (23%)	0.67 (0.52–0.87)	0.002	0.65 (0.50–0.85)	0.001
Financial dependency on others					
full	242 (32%)	1.43 (1.08–1.89)	0.011	1.42 (1.04–1.93)	0.027
partial	63 (25%)	1.0		1.0	
Knows someone with HIV/AIDS ^c					
No	280 (29%)	1.0		1.0	
1 person	13 (52%)	1.78 (1.00–3.17)	0.051	1.53 (0.76–3.10)	0.24
≥ 2 people	12 (71%)	2.21 (1.24–3.94)	0.007	3.63 (1.91–6.89)	0.0001
Social support reported at first follow-up visit					
low	26 (24%)	1.0		1.0	
adequate/high	257 (31%)	1.50 (1.00–2.25)	0.048	1.61 (1.04–2.50)	0.033
Prior attendance and weekly self-help group meetings					
no	157 (20%)	1.0		1.0	
yes	39 (38%)	1.58 (1.11–2.25)	0.012	1.75 (1.17–2.59)	0.006

^aEstimates obtained from univariate Cox proportional hazards regression models, using dummy variables to represent each category (except the reference).

^bThese estimates are derived from two different Cox models. Model 1 included duration of marriage, dependency, knowing someone with HIV, and social support. Model 2 included all of the above variables, plus prior attendance at social support group meetings. Women who reported disclosure at the first follow-up assessment could not be included in this second model because there was no measure for prior group attendance available. The magnitude of the adjusted estimates across the two models were not substantially different.

^cThe number of people known with HIV/AIDS was assessed at each follow-up assessment of disclosure. Thus, for observations counted as “events” (disclosure), these measures were taken from the assessment done at the time when disclosure was first reported. For women who never disclosed to a female relative, these measures were taken from the latest available assessment.

RR, relative risk; CI, confidence interval.