

Sociodemographic predictors of non-disclosure of HIV sero-status to sexual partners in suburban area of southern Mozambique

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Abstract

The HIV prevalence in Maputo city is 16.2%. There is a paucity of data describing factors associated with disclosure or non-disclosure of HIV-positive sero-status to sexual partners. This study aims to describe predictors of HIV sero-status-disclosure to sexual partners among people living with HIV (PLHIV) as per analytical study carried-out at three health facilities in the suburban area of Maputo, Mozambique.

We used prospective cohort study design of PLHIV aged over 18 years in suburban area of Maputo. Data were collected between December 2019 and December 2020. Crude and adjusted logistic regression were used to analyze and model predictors of non-disclosure of their HIV sero-status.

A total of 377 patients were enrolled in the HIV sero-status disclosure study. Of these, nearly two-thirds 61.5% were women, 52.9% had secondary school, 47.7% were aged between 25-34 years, 50.9% had informal employment with low income, 73.2% were married. The proportion of patients regarding gender was significantly different, women were higher in contrast to men, in those aged 15-24 years (23.3% [95% CI: 18.2 – 29.0] vs 2.1% [95% CI: 0.5 – 5.4], $p=0.000$); employment contract with maximum wage(43.1% [95% CI: 36.8 – 49.5] vs 22.8% [95% CI: 16.3 – 30.1], $p=0.000$); single civil status (29.7% [95% CI: 24.1 – 35.8] vs 19.4% [95% CI: 13.2 – 26.5], $p=0.020$). 70 (18.6%, 95% CI: 22.7) of overall did not disclose their HIV sero-status to the sexual partner after 12 months of follow up. Crude logistic regression showed higher likelihood of non-disclosure in those who had an employment contract with maximum wage (Crude Odds Ratio [cOR] 2.02, 95% confidence interval [CI] : 1.15 – 3.55, $p=0.015$); were single (cOR 3.85, 95% CI: 2.22 – 6.69, $p=0.000$); were living with parents (cOR 2.30, 95% CI: 1.07 – 4.93, $p=0.033$); received financial support for their monthly household expenses from parents or a close relative (cOR 7.15, 95% CI: 2.19 – 23.36, $p=0.001$); or brought a parent/lose relative and/or a friend as a confidant during enrollment period of Program Confidant (cOR 3.17 , 95% CI: 1.74 – 5.76, $p=0.000$; and cOR 5.97, 95% CI: 1.57 – 22.66, $p=0.009$, respectively). From parents/close relative and from partner (Adjusted Odds Ratio [aOR] 8.19, 95% CI: 1.44 – 46.46, $p=0.018$; and aOR 4.34, 95% CI: 1.05 – 17.17, $p=0.043$), respectively); in those who brought a parent/close relative and/or a friend as a confidant during enrollment period of Program (aOR 8.86, 95% CI: 2.16 – 36.31, $p=0.002$; and 195 aOR 21.68, 95% CI: 3.02 – 155.87, $p= 0.002$, respectively).

Factors independently associated with non-disclosure of HIV-positive sero-status were employment contract with medium/high income, single status, living with parents, received financial support for their monthly household expenses from parents/close relatives, brought a parent/close relative and/or a friend as a confidant during enrollment period of study. This information should help to support a social intervention strategy to improve HIV sero-status disclosure in PLHIV, which is urgent within suburban society.

1 | INTRODUCTION

The Mozambican national survey, INSIDA 2021, revealed that the annual incidence of HIV was 0.43% among adults over 15 years of age, being higher among women (0.61%) versus men (0.24%); The prevalence of HIV was 12.5% in adults, which corresponds to approximately 2,097,000 PLHIV, being higher among 15% women versus 9.5% men [1].

Knowledge about HIV sero-status among people living with HIV (PLHIV) is the foundation for adopting and promoting safer sexual practices and encouraging disclosure to sexual partners, and to increase partner testing [2].

Previous studies from other countries such as Tanzania revealed that barriers to timely disclosure included denial of one's status, fear of stigmatization, fear of being separated or divorced, need to protect loved ones and lack of adequate knowledge about the disease [3], [4].

Supporting HIV patients to disclose their HIV sero-status to their partners and other people close to them is a practice that is becoming more widespread in several countries in Africa [5]–[9]. There are several benefits associated with HIV sero-status disclosure: for people infected with HIV, the disclosure of their sero-status with a close and trusted person fosters relief and closeness and is an important first step in creating a foundation of social support. However, for society as a whole, the revelation of the sero-status of people infected with HIV contributes to raising awareness about the HIV epidemic, and thus favoring the adoption of preventive medications and behaviors that contribute to reducing the transmission of infections, as well as contributing to the fight against the stigma and discrimination associated with HIV infection [10].

Psychosocial support for people with a recent diagnosis of HIV infection, carried out in the context of partner support services, creates the conditions that facilitate the disclosure of the sero-status of infected people to their partners and allows the identification of *coping* mechanisms for individuals living with HIV [11].

Services to support the disclosure of HIV sero-status to partners consist of providing psychosocial support to patients with HIV with the view that trust and adequate counseling from health care workers helps prompt disclosure, encourages testing, and strengthens adherence to HIV care and treatment [12].

Supporting the disclosure of the HIV sero-status of sexual partners is an effective component in the HIV epidemic control strategy [10], as it leads to increased identification of new cases of HIV, and the timely initiation of care and treatment for infected people, many of whom are sexually active and recently infected, and who do not know their HIV sero-status, therefore being the main vector in the spread of HIV to new people.

Timely access to antiretroviral treatment and the consequent reduction of patient attrition after starting ART [13], accompanied by other preventive measures, represent the main strategy for the control of the HIV epidemic.

Certain factors constitute barriers to the disclosure of sero-status for sexual partners. According to some studies, concealing the disclosure of a seropositivity diagnosis is influenced by the fear of triggering a disruptive emotional crisis in the recipient of the information, and of becoming a target of discrimination [14]. Similarly, it is considered as impeding an emotional self-protection strategy or seen as an emotional overload for the recipient of the information.

According to a qualitative study, HIV-positive people who choose to disclose seropositivity to their partner seek to regain control over their lives, diminish the *stress* associated with non-disclosure and anxiety caused by sexual relations with a partner who is unaware of their seropositivity [15]. In some cases, a change in the pattern of behavior may occur, reducing the number of sexual partners and consequently reducing the number of disclosures.

In the study conducted in Mozambique on the impact of the disclosure of seropositivity on the marital subsystem, it was concluded that the disclosure of the seropositivity diagnosis occurs in situations in which the individual with HIV/AIDS trusts the person to whom it will be revealed, only when this fundamental element is established, the individual feels confident in exposing themselves with the guarantee that confidentiality will be maintained, as HIV/AIDS continues to be seen as a private matter and not a public matter [16]. Thus, the individuals who are more trustworthy and with whom greater cooperation and mutuality is established, become worthy of revelation and those who lack or have less trust do not reveal themselves. However, we recognize that there may be situations where even if there is trust and reciprocity, there may not be disclosure, because *HIV/AIDS* is considered a private and confidential matter.

Marital status, age, level of education, fear of physical, verbal or economic violence, are some, among many other factors, that can facilitate or prevent the disclosure of the sero-status [17], [18].

A better understanding of the sociodemographic factors that constitute barriers or facilitate the disclosure of sero-status can help identify more effective and feasible disclosure support approaches for the Mozambican context.

Between 2014 and 2018, the Ministry of Health with the technical support of I-TECH Mozambique carried out pilot interventions to assess the acceptability, feasibility and effectiveness of supportive interventions for the disclosure of serostatus for sexual partners [12]. The pilot included the design of a methodology adapted for Mozambique, the development of a training package containing support tools, namely standardized operating procedures, and monitoring and evaluation instruments [4].

Following the experiments carried out, in 2018 the Ministry of Health adopted at a national level the implementation of the approach to support the disclosure of sero-status for sexual partners, the invitation of these for testing and accessing to care and treatment if they have a positive result in the HIV test.

Experience in the implementation of serostatus disclosure support programs for sexual partners has shown that the approach used is widely accepted in Mozambique among people with a recent HIV diagnosis. In this experiment, 74% of cases of HIV patients revealed their serostatus to their partners. Experience has also shown that it is effective in identifying new people infected with HIV. In the same series, a seropositivity rate was observed among the partners of the index cases tested for HIV between 57 and 62%; and 95% of all new HIV cases identified among index case partners were linked to HIV care and treatment [19]). Therefore, these results are comparable to the best results reported by a Ugandan study [20]. For low-income countries, which reported disclosure rates ranging from 16.7% to 86% of the index cases listed.

The approach is equally effective in identifying serodiscordant couples, as well as showing that, contrary to the entrenched and commonly accepted concept, the likelihood of adverse effects occurring in the sequence of serostatus disclosure to sexual partners is very low, and the risk of gender-based violence occurring following the act of disclosure can be further minimized by integrating an effective screening and management approach to the risk of gender-based violence (GBV) in interventions to support the disclosure of HIV sero-status [21]–[23].

Since there is a need to identify the sociodemographic factors associated with the motivation of PLHIV to disclose their HIV sero-status, this evaluation was proposed, which may help in suggesting measures that can support the increase in disclosure rates. This program has been implemented since 2016 and has covered three health facilities (HF) in the city of Maputo, namely: José Macamo health center, Bagamoyo health center and Polana Caniço General Hospital.

Hypothetically, non-disclosure of HIV sero-status continues to be a problem in the general population. Therefore, it is crucial to identify socio-demographic factors that contribute for non-disclosure to sexual partners among PLHIV, because to date there is a lack of studies that report the main barriers behind non-disclosure of HIV sero-status in Mozambique.

To continuously evaluate the success of HIV care and treatment programs in Mozambique, data on disclosure of HIV sero-status, one of the main indicators reportable by the WHO, should be periodically reported. Until now, there has been a paucity of data to quantify HIV disclosure and to describe the barriers associated with non-disclosure of HIV sero-status to a sexual partner in Mozambique. This study aimed to describe the predictors of HIV sero-status disclosure to a sexual partner, in suburban areas of Mozambique.

2 | METHODS

2.1 | Study setting or area.

The intervention took place in 3 high-volume urban/peri-urban health facilities in Maputo city. José Macamo is a centric HF, attached to a referral hospital, while Polana Caniço and Bagamoyo are sub-urban primary level HF. All are considered high volume HIV clinics, with more than 8.000 HIV+ patients in follow-up.

During a 9-month period, newly diagnosed HIV+ patients linked to care/treatment in these 3 health facilities were periodically interviewed by a team of counsellors to assess their disclosure status, with a focus on disclosure to sexual partners.

2.2 | Study design and population

The institution-based cross-sectional study design was conducted. The key population of this study were people aged 18 or over who tested positive for HIV and subsequently initiated ART monitoring and treatment in any of the 3 public health facilities in the city of Maputo previously mentioned above, between December 2019 and December 2020.

2.3 | Inclusion and exclusion criteria

Patients were prospectively enrolled into the study from December 2019 to December 2020. All patients whose ages were 18 years or above were included in the study. Patients with mental illness, serious medical illness and who did not give informed consent were excluded from the study.

2.4 | Study sample size and sampling procedure

The sample size consisted of the total universe of HIV index case patients that enrolled to the HIV sero-status disclosure program, registered in the three sites, according to the registry book, during the enrollment period between December 2019 and December 2020, and with defined eligibility criteria. Therefore, no sampling calculation criteria were applied.

2.5. | Operational or conceptual definition

According to the original articles on HIV disclosure [24], [2], approaches implemented in other countries, the adopted operational or conceptual definition were as follows:

2.5.1 | HIV disclosure

HIV disclosure is defined as the process of disclosing one's HIV positive sero-status to sexual partner(s), family members or other people in one's social circle and which usually occurs gradually over time [24].

2.5.2 | HIV index case

The index case is defined as someone HIV infected and aware of their sero-status and enrolled in care and treatment, who identifies other individuals with whom they have had a sexual relationship [2]. This index case might identify

other people that might have been exposed to HIV through sexual means or other ways (ex, children born from HIV+ women).

2.4 | Data collection

A structured interviewer-administered questionnaire and extraction of clinical routine data (from paper-based patient files and electronic records) considered as secondary data were used to collect the information. The questionnaire contains independent variables categorized into distinguished fields: (1) demographic profile: gender and age group; (2) education; (3) profession/source of livelihood; (4) marital status; (5) household and its characteristics; (6) characteristics of partners and degree of confidentiality between partners at the time of disclosure of HIV sero-status. The collected data were reviewed and checked daily for completeness and consistency of response by the supervisor. Data collected were anonymized to remove identifying details: each patient was given an alphanumeric code, and the anonymized data were included in the data sheet. Spreadsheet data were exported to SPSS for further data analysis.

2.5 | Outcome data and statistical analysis of data

Primary outcome was disclosure of HIV sero-status to sexual partner after 9 months of enrollment. Statistical analysis was performed using IBM® Statistical Package for the Social Sciences (SPSS) Statistics Software version 25 (International Business Machines Corporation, IBM corp, Release 2017, <https://www.ibm.com/legal/copytrade>, USA). Patients' baseline characteristics, as described above, were compared according to gender. We calculated frequencies and proportions for categorical data and presented these results by disclosure outcome (disclosed versus not disclosed). We present baseline descriptive results with statistical tests. We compared the proportion of patients who did not disclose their HIV sero-status according to independent variables, crude and adjusted logistic regression modeling, reporting adjusted odds ratios (aOR) with corresponding 95% confidence interval (CI). Predictors of variables with a p-value of less than 0.5 in crude analyses were entered into the multivariate model.

2.6 | Ethical approval and consent to participate.

Ethical clearance was obtained from the Mozambican National Bioethics Committee for Health (*IRB0002657 – Comité Nacional de Bioética para a Saúde, Ref: 107/CNBS/20*) and permission to perform the research was also obtained from the Maputo City Health Directorate (Direcção de Saúde da Cidade de Maputo, N/Ref. n.º 1201/DSCM-DPS/0501/2019). Written informed consent was obtained from all subjects who participated in the research. All information obtained during the study was kept confidential. Analysis was performed on de-identified, aggregated patient level data. Furthermore, this study was conducted in accordance with the principles of the Declaration of Helsinki.

2.5.1 | Consent for publication

Written informed consent for publication was obtained from all subjects who participated in the research.

3 | RESULTS

3.1 | Social and demographic characteristics of HIV Index case patients by gender

A total of 377 patients were enrolled to HIV sero-status disclosure program in the three sites, from December 2019 to December 2020. Of these, nearly two-third 61.5% (95% CI: 56.6 – 66.3) were women, more than half 52.9% (95% CI: 47.9 – 57.9) had secondary school, almost half 47.7% (95% CI: 42.7 – 52.8) were aged between 25-34 years, half 50.9% (95% CI: 45.9 – 56.0) had informal employment with low income, nearly three-quarter 73.2% (95% CI: 68.5 – 77.5) were married. (Table 1)

In terms of sociodemographic profile, the proportion of patients in relation to gender was significantly different, women were higher in contrast to men, in those aged 15-24 years (23.3% [95% CI: 18.2 – 29.0] vs 2.1% [95% CI: 0.5 – 5.4], $p=0.000$); employment contract with maximum wage(43.1% [95% CI: 36.8 – 49.5] vs 22.8% [95% CI: 16.3 – 30.1], $p=0.000$); single civil status (29.7% [95% CI: 24.1 – 35.8] vs 19.4% [95% CI: 13.2 – 26.5], $p=0.020$). (Table 1)

In terms of households, the proportion of family care provision required from men in relation to women were higher in those whose family composition was 5-6 individuals (31.7% [CI: 95%: 24.3 – 39.6] vs 22.4% [CI: 95%: 17.4 – 28.1], $p=0.047$); holding 3-4 sons/daughters, (34.5% [CI: 95%: 27.4 – 42.5] vs 15.1% [CI: 95%: 10.9 – 20.1], $p=0.000$); taking care 3-4 children ≤ 5 years old, (19.3% [CI: 95%: 13.2 – 26.3] vs 9.1% [CI: 95%: 5.9 – 13.3], $p=0.005$); sustaining 3-4 individual dependents including outside the household, (43.4% [CI: 95%: 35.5 – 51.6] vs 29.3% [CI: 95%: 23.7 – 35.4], $p=0.000$). (Table 1)

Regarding to financial expenses, the proportion of economic dependence of women over men were higher, in those who did not pay the rent for the house (34.5% [CI: 95%: 28.6 – 40.8] vs 24.1% [CI: 95%: 17.3 – 31.6], $p=0.000$); partner paying full monthly household expenses (10.3% [CI: 95%: 6.9 – 14.8] vs 2.1% [CI: 95%: 0.5 – 5.4], $p=0.000$). (Table 1)

Concerning the partner support, the proportion of favorable relief for women compared to men was higher, help with household expenses (71.1% [CI: 95%: 65.1 – 76.7] vs 37.2% [CI: 95%: 29.4 – 45.3], $p=0.000$); personal expenses: gifts, clothes, travel, credits and cellphone, (52.2% [CI: 95%: 45.7 – 58.5] vs 21.4% [CI: 95%: 15.2 – 28.6], $p=0.000$). (Table 1)

With relevance to number of partners, the proportion of men compared to women was higher, having two or more partners (20.7% [CI: 95%: 14.2 – 27.8] vs 9.9% [CI: 95%: 6.6 – 14.3], $p=0.003$); (Table 1)

Overall, 73.5% (95% CI: 68.9 - 77.7) of enrolled participants revealed that they were in monogamous relationships, the proportion of men compared to women was higher (79.3% [CI: 95%: 72.8 – 85.3] vs 69.8% [CI: 95%: 63.7 – 75.5], $p=0.000$); (Table 1)

3.2 | HIV Index case characteristics according to HIV sero-status disclosures

Overall, 70 (18.6%, 95% CI: 14.9 – 22.7) of 377 HIV Index cases patients did not disclose their HIV sero-status to the sexual partner after 9 months of follow up (Fig. 1). The proportion of patients who did not disclose their HIV sero-status compared to those who did was significantly higher in women than in men (82.9% [95% CI: 72.8 – 90.9] vs 56.7% [95% CI: 51.1 – 62.1], $p=0.000$); in persons followed-up in Health Center (CS) Jose Macamo (50.0% [95% CI: 38.5 – 61.5] vs 35.5% [95% CI: 30.3 – 41.0], $p=0.008$); in those who had an employment contract with maximum wage (47.1% [95% CI: 35.8 – 58.5] vs 32.6% [95% CI: 27.5 – 38.0], $p=0.049$); in those that lived with parents (18.5% [95% CI: 10.5 – 29.1] vs 9.1% [95% CI: 6.3 – 12.7], $p=0.000$); in those that did not live in their own home (62.9% [95% CI: 51.2 –

73.5] vs 45.9% [95% CI: 40.4 – 51.5], $p=0.011$); in those that received financial support for their monthly household expenses from parents/close relatives (10.0% [95% CI: 4.6 – 18.6] vs 1.6% [95% CI: 0.6 – 3.5], $p=0.001$); (Table 2).

3.3 | Predictors of non-disclosure of HIV status

Regarding the univariable logistic regression model, men were less likely to not disclose their HIV sero-status to sexual partner compared to women (aOR 0.27, 95% CI: 0.14 – 0.52, $p=0.000$); those followed in Polana Caniço were less likely to not disclose their HIV sero-status compared to CS Jose Macamo (cOR 0.34, 95% CI: 0.17 – 0.69, $p=0.003$); those who had an employment contract with maximum wage had a two-fold increase in the likelihood of not disclosing their HIV sero-status compared to those had informal employment with minimum and average wage (cOR 2.02, 95% CI: 1.15 – 3.55, $p=0.015$); Regarding marital status, not being married conferred a nearly four-fold increase in the likelihood of not disclosing their HIV sero-status compared to being married. (cOR 3.85, 95% CI: 2.22 – 6.69, $p=0.000$); those living with parents had more than a two-fold increase in the likelihood of not disclosing their HIV sero-status compared to those who lived with their own family (cOR 2.30, 95% CI: 1.07 – 4.93, $p=0.033$); those who lived with a sexual partner in the same house were less likely to not disclose their HIV sero-status compared to those who lived alone (cOR 0.26, 95% CI: 0.15 – 0.45, $p=0.000$);

Those who live in their own house are half as likely to not disclose their HIV sero-status to their sexual partner, compared to those who do not own the house they live in. (cOR 0.50, 95% CI: 0.29 – 0.86, $p=0.011$); and those who received financial support for their monthly household expenses from parents/close relatives had a seven-fold increase in the likelihood of not disclosing their HIV sero-status compared to those who paid their own household expenses (cOR 7.15, 95% CI: 2.19 – 23.36, $p=0.001$); (table 3).

According to the multivariable logistic regression model, men were less likely to not disclose their HIV sero-status to their sexual partner compared to women (aOR 0.38, 95% CI: 0.16 – 0.95, $p=0.038$); those followed in CS Bagamoyo and Polana Caniço were 92% and 93% less likely to not disclose their HIV sero-status compared to CS José Macamo (aOR 0.08, 95% CI: 0.02 – 0.38, $p=0.011$; and aOR 0.07, 95% CI: 0.01 – 0.30, $p=0.000$), respectively; those who received financial support for their monthly household expenses from parents/close relative and/or a partner had an eight-fold and more than four-fold increase in the likelihood of not disclosing their HIV sero-status compared to those who paid their own household expenses (aOR 8.19, 95% CI: 1.44 – 46.46, $p=0.018$; and aOR 4.34, 95% CI: 1.05 – 17.17, $p=0.043$), respectively.

4 | DISCUSSION

This is one of the first Mozambican analysis of sociodemographic predictors for non-disclosure of HIV sero-status to sexual partners. We aimed to determine the sociodemographic factors of PLWHIV in the peri-urban areas of Maputo city that may represent barriers to disclosing HIV sero-status to sexual partners.

We reported a predominance of almost half of the people infected with HIV and initiating ART follow-up, in the age group of 25 to 34 years, a similar reality found in other studies carried out in Mozambique [13]. In our cohort, there was a predominance of women between the 15-24 age group, which demonstrates a predominance of younger women seeking diagnostic disclosure services.

In our findings, there was a predominance of 29.7% of single women over 19.4% of single men, that contrasts with population statistics from Maputo, which reported a predominance of 55.4% of single men over 50.7% of single women [25]. Therefore, the proportion of women in this study can be explained by some points to be considered: (first)

high prevalence of HIV among women in general, and specifically in the age groups in question, a fact that is attributable to social and biological factors [26]; (second) The fact that women use health services more than men, which justifies the need and relevance of health programs such as “Male Engagement” [27]. When we talk about single women, we mainly include divorced women (dissolution of relationships) in this subgroup: highlighting that among people with HIV, the phenomenon of dissolution of relationships is very common, and greatly affects women, who are abandoned rather than men, for various reasons [28]; It is important to consider the fact that women constitute the largest proportion of people infected with HIV [26].

In our assessments, women were less likely to disclose their HIV Status; the same is found in other literature, which argues that women fail to reveal their HIV infection status due to fear of stigma, guilt, abuse, abandonment, violence [29].

Half of the people in the cohort had informal jobs with minimum and average wages (most of them are operating machines, bodyguards, primary teacher, carpenter, barber shop, taxi driver, domestic servants). Additionally, Minimum Wages in Mozambique increased to 5800 MZN/Month (91,695 USD/Month) in 2023. The maximum rate of minimum wage for employees was 4390 MZN/Month and minimum was 2005 MZN/Month.[30]–[32]. In our evaluation, those who had an employment contract with maximum wage did not disclose their HIV status. Our finding is contradictory across different studies, some Tanzanian studies report that those who were formally employed were more likely to disclose their HIV sero-status to sexual partners[33]. In our estimation, there was a predominance of women with jobs with maximum wage, this is due to the fact that the men with high-end jobs on a reported scale generally do not seek public health services, when they become ill they seek for emergency services, such as pharmacy and emergency room, while women, regardless of their social level, level of education or job position they occupy, generally seek public services, mainly in health services. maternal and child health, where everyone is tested for HIV [34]. In our cohort, women are in an advantageous position compared to men, in the sense that they do not pay the rent for the house where they live, since their partner pays all the monthly household expenses. Thus, men appear to be the responsible for paying women’s expenses such as: gifts, travel, credits, cellphone. Furthermore, men took on more economic responsibilities in caring for the family, supporting a household with more than 5 people counting on them, including children under 5 years of age. Compared to what was observed in women, they provided economic care to families of 3 or fewer household members.

In our appraisal, men mentioned that they had more than two sexual partners, in contrast to women who reported had less than two. These findings are consistent with the notion that male tend to report higher number of sexual partners, as it is associated with success therefore socially accepted, while women tend to report lower number of sexual partners, which is more valued in society in general [35]. That’s why women tend not to reveal the exact number of partners they had or have, to protect their reputation. In our studies, those who did not live with their partner in the same house and/or did not have a confidant at enrollment were less likely to reveal their HIV serological status. Recent studies have shown that loneliness is a predictor of poor health and early mortality in the general population and is more pronounced among people with HIV. Thus, lonely, and HIV-infected people are more likely to suffer from mental disorders, specifically anxiety disorders, major depression with tendencies towards suicidal ideations, which may cause poor adherence to ART. Therefore, there is an urgent need for an intervention centered on the experiences of loneliness within the accumulation of losses and stigmas in the context of HIV [36]. In our studies, those who did not live with their partner in the same house and/or did not have a confidant at the time of enrollment did not reveal their serological status. Some studies have reported that loneliness is the main factor in low interest in health and self-esteem [36], [37].

In our putting, those who lived with their parents did not reveal their serological status. It may be due to different reasons: (first) trusting that relationships are better maintained with the sexual partner than with the parents themselves [10]; (second) In Mozambican society, parents are less likely to talk about sex and HIV with their children, so children are more likely to discuss these matters with their friends [38]. Therefore, this shows us how stigma produces an environment of loneliness and secrecy, which inflects disclosure unevenly across different life spaces and health worlds. This undermines the social normalization of HIV, the search for treatment and its adherence, which, in turn, can increase morbidity and contribute to drug resistance resulting in increased mortality rates among patients infected with HIV. [37]. In our report, those who receive financial support for their monthly household expenses from parents/close relative, did not reveal their serological status. Some research referred fear of loss of benefits from those who paid their fees and stigma [33], [37].

Conclusion

Factors independently associated with non-disclosure of HIV serostatus were employment contract with medium/high income, single status, living with parents, receiving financial support for their monthly household expenses from parents/close relatives, brought a parent/close relative and/or a friend as a confidant during enrollment period of study. This information should help to support a social intervention strategy to improve HIV sero-status disclosure in PLHIV, which is urgent within suburban society.

Abbreviations

ART: antiretroviral treatment

aOR: Adjusted Odds Ratio

CI: confidence intervals

cOR: Crude Odds Ratio

HF: Health facilities

PEPFAR: President's Emergency Plan for AIDS Relief,

PLHIV: people living with HIV,

UNAIDS: United Nations Programme on HIV/AIDS,WHO: World Health Organization

Declarations

Ethics approval and consent to participate.

Mozambican National Bioethics Committee for Health (*IRB0002657 – Comité Nacional de Bioética para a Saúde, Ref: 107/CNBS/20*) approved this analysis. Analysis was performed on de-identified, aggregated patient level data, and the need for written informed consent was explicitly waived.

Consent for publication

We performed analysis on routine administrative data; consent for publication is not applicable.

Availability of data and materials

The datasets analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no conflict of interest.

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Authors' contributions

F.M. contribute on study design, data acquisition, study implementation, analysis and implementation of data, major contribution to writing, read, and approved final version. **M.R., E.P., A.C., J.W. & A.I.M.**, contributed equally on study design, study implementation, writing, read and approved final version. **Z.P., A.M., F.V., S.B., G.A. & R.U.** contributed equally on data acquisition, study implementation, writing, read, and approved final version. **E.N.** contribute on analysis and interpretation of data, major contribution to writing, read and approved final version.

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Tables

Table 1: Background of HIV index cases patients by sex

N= 377		Total, N(%)	95% CI	Women, N(%)	95% CI	Men, N(%)	95% CI	p- value
P01.1. Health Facilities	CS José Macamo	144 (38.2)	(33.4 - 43.2)	92 (39.7)	(33.5 - 46.0)	52 (35.9)	(28.4 - 43.9)	0.759
	CS Bagamoyo	111 (29.4)	(25.0 - 34.2)	67 (28.9)	(23.3 - 34.9)	44 (30.3)	(23.3 - 38.2)	
	HG Polana Caniço	122 (32.4)	(27.8 - 37.2)	73 (31.5)	(25.7 - 37.6)	49 (33.8)	(26.4 - 41.8)	
P2.01.C_Education grade	No School	28 (7.4)	(5.1 - 10.5)	20 (8.7)	(5.5 - 12.8)	8 (5.5)	(2.1 - 10.1)	0.439
	Primary	124 (33.0)	(28.4 - 37.2)	70 (30.3)	(24.6 - 36.4)	54 (37.2)	(29.4 - 45.3)	
	Secondary	199 (52.9)	(47.9 - 57.4)	125 (54.1)	(47.7 - 60.5)	74 (51.0)	(42.5 - 59.1)	
	Superior	25 (6.6)	(4.5 - 9.4)	16 (6.9)	(4.2 - 10.7)	9 (6.2)	(3.1 - 11.0)	
P2.04.1. Age_Band	15-24 yr	57 (15.1)	(11.8 - 19.1)	54 (23.3)	(18.2 - 29.0)	3 (2.1)	(0.5 - 5.4)	0.000
	25-34 yr	180 (47.7)	(42.7 - 52.4)	118 (50.9)	(44.5 - 57.3)	62 (42.8)	(34.5 - 50.9)	
	35-44 yr	105 (27.9)	(23.5 - 32.2)	46 (19.8)	(15.1 - 25.3)	59 (40.7)	(32.4 - 48.8)	
	45-54 yr	29 (7.7)	(5.3 - 10.5)	12 (5.2)	(2.9 - 8.6)	17 (11.7)	(7.1 - 17.7)	
	=>55 yr	6 (1.6)	(0.7 - 3.0)	2 (0.9)	(0.2 - 2.7)	4 (2.8)	(0.6 - 6.4)	
P2. 05C Profission / source of livelihood	Informal employment with minimum and average wage	192 (50.9)	(45.9 - 56.4)	83 (35.8)	(29.8 - 42.1)	109 (75.2)	(67.8 - 81.7)	0.000
	Employment contract with maximum wage	133 (35.3)	(30.6 - 40.3)	100 (43.1)	(36.8 - 49.5)	33 (22.8)	(16.3 - 30.1)	
	Jobless with parents aid	52 (13.8)	(10.6 - 17.1)	49 (21.1)	(16.2 - 26.7)	3 (2.1)	(0.5 - 5.4)	
P2. 07. Civil Status band	Marital/marriage status	273 (73.2)	(68.5 - 77.6)	157 (68.6)	(62.3 - 74.3)	116 (80.6)	(73.8 - 86.4)	0.020
	Single	96 (25.7)	(21.5 - -	68 (29.7)	(24.1 - -	28 (19.4)	(13.2 - -	

			30.2)		35.8)		26.5)	
	Divorced/separated	4 (1.1)	(0.4 - 2.0)	4 (1.7)	(0.6 - 4.1)	0 (0.0)	(0.0 - 0.0)	
Sec 2.01. Who did you live with?	Own Family	229 (61.6)	(56.5 - 66.5)	133 (58.1)	(51.6 - 64.3)	96 (67.1)	(59.7 - 74.4)	0.059
	Parents	40 (10.8)	(7.9 - 14.7)	26 (11.4)	(7.7 - 15.9)	14 (9.8)	(5.1 - 15.5)	
	Own famly & parents	95 (25.5)	(21.3 - 30.2)	68 (29.7)	(24.1 - 35.8)	27 (18.9)	(13.2 - 25.9)	
	Friends	2 (0.5)	(0.1 - 1.0)	0 (0.0)	(0.0 - 0.0)	2 (1.4)	(0.4 - 4.4)	
	Alone	6 (1.6)	(0.7 - 3.0)	2 (0.9)	(0.2 - 2.8)	4 (2.8)	(1.6 - 6.5)	
Sec 2.02. How many people lived with you including you	<=2 individuals	58 (15.4)	(12.0 - 19.1)	31 (13.4)	(9.4 - 18.2)	27 (18.6)	(12.2 - 25.5)	0.047
	3-4 individuals	159 (42.2)	(37.3 - 47.3)	106 (45.7)	(39.4 - 52.1)	53 (36.6)	(29.4 - 44.6)	
	5-6 individuals	98 (26.0)	(21.8 - 30.2)	52 (22.4)	(17.4 - 28.1)	46 (31.7)	(24.3 - 39.6)	
	=> 7 individuals	62 (16.4)	(13.0 - 20.1)	43 (18.5)	(13.9 - 23.9)	19 (13.1)	(8.1 - 19.3)	
Sec 2.03. How many sons/daughters did you have when you enrolled in the program?	None	96 (25.5)	(21.3 - 30.2)	71 (30.6)	(24.9 - 36.7)	25 (17.2)	(11.2 - 24.0)	0.000
	1-2 Sons/daughters	182 (48.3)	(43.3 - 53.4)	121 (52.2)	(45.7 - 58.5)	61 (42.1)	(34.5 - 50.2)	
	3-4 Sons/daughters	85 (22.5)	(18.5 - 27.1)	35 (15.1)	(10.9 - 20.1)	50 (34.5)	(27.4 - 42.5)	
	5-6 Sons/daughters	9 (2.4)	(1.2 - 4.1)	4 (1.7)	(0.6 - 4.0)	5 (3.4)	(1.7 - 7.4)	
	=>7 Sons/daughters	5 (1.3)	(0.5 - 2.0)	1 (0.4)	(0.0 - 2.0)	4 (2.8)	(0.6 - 6.4)	
Sec 2.04. Of your children, how many were under 5 years old?	None	124 (32.9)	(28.3 - 37.2)	87 (37.5)	(31.5 - 43.9)	37 (25.5)	(19.3 - 33.0)	0.005
	1-2 Children	203 (53.8)	(48.8 - 58.4)	124 (53.4)	(47.0 - 59.8)	79 (54.5)	(46.6 - 62.4)	
	3-4 Children	49 (13.0)	(9.9 - 16.9)	21 (9.1)	(5.9 - 13.3)	28 (19.3)	(13.2 - 26.3)	

	5-6 Children	1 (0.3)	(0.0 - 1.0)	0 (0.0)	(0.0 - 0.0)	1 (0.7)	(0.3 - 3.2)	
	=> 7 Children	0 (0.0)	(0.0 - 0.0)	0 (0.0)	(0.0 - 0.0)	0 (0.0)	(0.0 - 0.0)	
Sec 2.05. How many people depended on you, including people outside the household?	0 individuals	58 (15.4)	(12.0 - 19.3)	51 (22.0)	(17.0 - 27.6)	7 (4.8)	(2.9 - 9.2)	0.000
	1-2 individuals	120 (31.8)	(27.3 - 36.7)	92 (39.7)	(33.5 - 46.0)	28 (19.3)	(13.2 - 26.3)	
	3-4 individuals	131 (34.7)	(30.1 - 39.7)	68 (29.3)	(23.7 - 35.4)	63 (43.4)	(35.5 - 51.6)	
	5-6 individuals	41 (10.9)	(8.0 - 14.3)	12 (5.2)	(2.9 - 8.6)	29 (20.0)	(14.2 - 27.1)	
	=> 7 individuals	27 (7.2)	(4.9 - 10.1)	9 (3.9)	(1.9 - 7.0)	18 (12.4)	(7.1 - 18.5)	
Sec 2.06. When you enrolled in the program, did you live with your partner in the same house?	No	115 (30.5)	(26.0 - 35.3)	82 (35.3)	(29.4 - 41.6)	33 (22.8)	(16.3 - 30.1)	0.010
	Yes	262 (69.5)	(64.7 - 74.0)	150 (64.7)	(58.4 - 70.6)	112 (77.2)	(69.8 - 83.5)	
Sec 2.07. Was the partner you lived with the father or mother of your children?	No	25 (6.6)	(4.4 - 9.5)	15 (6.5)	(3.8 - 10.2)	10 (6.9)	(3.1 - 11.9)	0.000
	Yes	175 (46.4)	(41.4 - 51.5)	87 (37.5)	(31.5 - 43.9)	88 (60.7)	(52.6 - 68.4)	
	Missed	177 (46.9)	(42.0 - 52.0)	130 (56.0)	(49.6 - 62.3)	47 (32.4)	(25.4 - 40.3)	
Sec 2.08. When you enrolled in the program, were you living in your own home?	No	185 (49.1)	(44.0 - 54.1)	131 (56.5)	(50.0 - 62.7)	54 (37.2)	(29.4 - 45.3)	0.000
	Yes	192 (50.9)	(45.9 - 56.0)	101 (43.5)	(37.3 - 50.0)	91 (62.8)	(54.7 - 70.3)	
Sec 2.09. If he wasn't in his own house, who paid the rent for the house where he lived?	Own	26 (6.9)	(4.7 - 9.8)	11 (4.7)	(2.5 - 8.1)	15 (10.3)	(6.1 - 16.1)	0.000
	Parents/close relative	44 (11.7)	(8.7 - 15.2)	40 (17.2)	(12.8 - 22.5)	4 (2.8)	(0.6 - 6.4)	
	Not paid	115 (30.5)	(26.0 - 35.3)	80 (34.5)	(28.6 - 40.8)	35 (24.1)	(17.3 - 31.6)	
	Missed	192 (50.9)	(45.9 - 56.0)	101 (43.5)	(37.3 - 50.0)	91 (62.8)	(54.7 - 70.3)	

Sec 2.11. Who paid for your household expenses? Did anyone help you with monthly expenses?	Own	336 (89.1)	(85.7 - 92.0)	195 (84.1)	(78.9 - 88.3)	141 (97.2)	(93.9 - 99.1)	0.000
	Parents/close relative	12 (3.2)	(1.8 - 5.3)	12 (5.2)	(2.9 - 8.6)	0 (0.0)	(0.0 - 0.0)	
	Partner	27 (7.2)	(4.9 - 10.1)	24 (10.3)	(6.9 - 14.8)	3 (2.1)	(0.5 - 5.4)	
	Parents & partner	2 (0.5)	(0.1 - 1.7)	1 (0.4)	(0.0 - 2.0)	1 (0.7)	(0.3 - 3.2)	
Sec 2.12.A. If your partner helped you with some expenses. Mention which expenses he or she helps with: Household expenses	Yes	219 (58.1)	(53.1 - 63.0)	165 (71.1)	(65.1 - 76.7)	54 (37.2)	(29.4 - 45.3)	0.000
	No	158 (41.9)	(37.0 - 46.9)	67 (28.9)	(23.3 - 34.9)	91 (62.8)	(54.7 - 70.3)	
Sec 2.12.B. If your partner helped you with some expenses. Mention what expenses he or she helps with: School: enrollment, transport, school supplies, etc.	Yes	124 (32.9)	(28.3 - 37.8)	94 (40.5)	(34.3 - 46.9)	30 (20.7)	(14.2 - 27.8)	0.000
	No	253 (67.1)	(62.2 - 71.7)	138 (59.5)	(53.1 - 65.7)	115 (79.3)	(72.8 - 85.3)	
Sec 2.12.C. If your partner helped you with some expenses Mention which expenses he or she helps with: Personal expenses: gifts, clothes, travel. Cell phone and credits, etc?	Yes	152 (40.3)	(35.5 - 45.3)	121 (52.2)	(45.7 - 58.5)	31 (21.4)	(15.2 - 28.6)	0.000
	No	225 (59.7)	(54.7 - 64.5)	111 (47.8)	(41.5 - 54.3)	114 (78.6)	(71.8 - 84.7)	
Sec 3.13. When you were enrolled in the program, did you have a confidant?	Yes	363 (96.3)	(94.0 - 97.9)	220 (94.8)	(91.4 - 97.1)	143 (98.6)	(95.9 - 99.7)	0.058
	No	14 (3.7)	(2.1 - 6.0)	12 (5.2)	(2.9 - 8.6)	2 (1.4)	(0.4 - 4.4)	
Sec 3.14. When you were enrolled in the program, did you have a confidant?	Partner	239 (63.4)	(58.4 - 68.1)	137 (59.1)	(52.6 - 65.2)	102 (70.3)	(62.7 - 77.3)	0.129
	Parent/close relative	111 (29.4)	(25.0 - 34.2)	76 (32.8)	(27.0 - 39.0)	35 (24.1)	(17.3 - 31.6)	
	Friend	10 (2.7)	(1.4 - 4.7)	6 (2.6)	(1.1 - 5.3)	4 (2.8)	(0.6 - 6.4)	
	Missed	17 (4.5)	(2.8 - 7.0)	13 (5.6)	(3.2 - 9.1)	4 (2.8)	(0.6 - 6.4)	
Sec 3.15. At the time he enrolled in the program he said he had [insert number of partners] in the last 2 years	<=1 partner	324 (85.9)	(82.2 - 89.2)	209 (90.1)	(85.7 - 93.4)	115 (79.3)	(72.8 - 85.3)	0.003
	=>2 partner	53 (14.1)	(10.8 - 17.8)	23 (9.9)	(6.6 - 14.3)	30 (20.7)	(14.2 - 27.8)	

Sec 3.16. From the partners mentioned to how many did you reveal?	None	70 (18.6)	(14.9 - 22.7)	58 (25.0)	(19.8 - 30.9)	12 (8.3)	(4.1 - 13.6)	0.000
	1 partner	277 (73.5)	(68.9 - 77.7)	162 (69.8)	(63.7 - 75.5)	115 (79.3)	(72.8 - 85.3)	
	=> 2 partner	30 (8.0)	(5.5 - 11.0)	12 (5.2)	(2.9 - 8.6)	18 (12.4)	(7.1 - 18.5)	
Pearson chi-square								

Table 2: HIV Index case patients according to HIV sero-status disclosure

N= 377		Total, N(%)	95% CI	Disclosed, N(%)	95% CI	Not disclosed, N(%)	95% CI	p-value
P01.1. Health Facilities	CS José Macamo	144 (38.2)	(33.4 - 43.2)	109 (35.5)	(30.3 - 41.0)	35 (50.0)	(38.5 - 61.5)	0.008
	CS Bagamoyo	111 (29.4)	(25.3 - 34.2)	88 (28.7)	(23.8 - 33.9)	23 (32.9)	(22.7 - 44.4)	
	HG Polana Caniço	122 (32.4)	(27.8 - 37.2)	110 (35.8)	(30.6 - 41.3)	12 (17.1)	(9.7 - 27.2)	
P2.03. Gender	Women	232 (61.5)	(56.6 - 66.3)	174 (56.7)	(51.1 - 62.1)	58 (82.9)	(72.8 - 90.9)	0.000
	Men	145 (38.5)	(33.7 - 43.4)	133 (43.3)	(37.9 - 48.9)	12 (17.1)	(9.7 - 27.2)	
P2.01.C_Education grade	No School	28 (7.4)	(5.1 - 10.4)	25 (8.2)	(5.5 - 11.6)	3 (4.3)	(1.2 - 11.1)	0.544
	Primary	124 (33.0)	(28.4 - 37.8)	97 (31.7)	(26.7 - 37.1)	27 (38.6)	(27.8 - 50.5)	
	Secondary	199 (52.9)	(47.9 - 57.9)	164 (53.6)	(48.0 - 59.1)	35 (50.0)	(38.5 - 61.6)	
	Superior	25 (6.6)	(4.5 - 9.5)	20 (6.5)	(4.2 - 9.7)	5 (7.1)	(2.8 - 14.1)	
P2.04.1. Age_Band	15-24 yr	57 (15.1)	(11.8 - 19.0)	43 (14.0)	(10.5 - 18.2)	14 (20.0)	(12.0 - 30.3)	0.602
	25-34 yr	180 (47.7)	(42.7 - 52.8)	146 (47.6)	(42.0 - 53.1)	34 (48.6)	(37.1 - 60.6)	
	35-44 yr	105 (27.9)	(23.5 - 32.5)	90 (29.3)	(24.4 - 34.6)	15 (21.4)	(13.1 - 32.3)	
	45-54 yr	29 (7.7)	(5.3 - 10.7)	23 (7.5)	(4.9 - 10.8)	6 (8.6)	(3.7 - 16.1)	
	=>55 yr	6 (1.6)	(0.7 - 3.3)	5 (1.6)	(0.6 - 3.5)	1 (1.4)	(0.2 - 6.6)	
P2. 05C Profission / source of livelihood	Informal employment with minimum and average wage	192 (50.9)	(45.9 - 56.0)	165 (53.7)	(48.2 - 59.3)	27 (38.6)	(27.8 - 50.5)	0.049
	Employment contract with maximum wage	133 (35.3)	(30.6 - 40.2)	100 (32.6)	(27.5 - 38.0)	33 (47.1)	(35.8 - 58.5)	
	Jobless with	52	(10.6	42 (13.7)	(10.2 -	10 (14.3)	(7.6 -	

	parents aid	(13.8)	- 17.5)		17.9)		23.2)	
P2. 07. Civil Status band	Marital/marriage status	273 (73.2)	(68.5 - 77.5)	239 (78.6)	(73.8 - 82.9)	34 (49.3)	(37.7 - 60.6)	0.000
	Single	96 (25.7)	(21.5 - 30.3)	62 (20.4)	(16.2 - 25.2)	34 (49.3)	(37.7 - 60.6)	
	Divorced/separated	4 (1.1)	(0.4 - 2.5)	3 (1.0)	(0.3 - 2.6)	1 (1.4)	(0.2 - 6.6)	
Sec 2. 01. Who did you live with?	Own Family	229 (61.6)	(56.5 - 66.4)	193 (62.9)	(57.4 - 68.1)	36 (55.4)	(43.3 - 67.0)	0.000
	Parents	40 (10.8)	(7.9 - 14.2)	28 (9.1)	(6.3 - 12.7)	12 (18.5)	(10.5 - 29.1)	
	Own family & parents	95 (25.5)	(21.3 - 30.1)	79 (25.7)	(21.1 - 30.8)	16 (24.6)	(15.4 - 36.0)	
	Friends	2 (0.5)	(0.1 - 1.7)	2 (0.7)	(0.1 - 2.1)	0 (0.0)	(0.0 - 0.0)	
	Alone	6 (1.6)	(0.7 - 3.3)	5 (1.6)	(0.6 - 3.5)	1 (1.5)	(0.2 - 7.0)	
Sec 2.02. How many people lived with you including you	<=2 individuals	58 (15.4)	(12.0 - 19.3)	49 (16.0)	(12.2 - 20.4)	9 (12.9)	(6.6 - 22.1)	0.377
	3-4 individuals	159 (42.2)	(37.3 - 47.2)	127 (41.4)	(36.0 - 46.9)	32 (45.7)	(34.4 - 57.4)	
	5-6 individuals	98 (26.0)	(21.8 - 30.6)	84 (27.4)	(22.6 - 32.5)	14 (20.0)	(12.0 - 30.5)	
	=> 7 individuals	62 (16.4)	(13.0 - 20.4)	47 (15.3)	(11.6 - 19.7)	15 (21.4)	(13.1 - 32.1)	
Sec 2.03. How many sons/daughters did you have when you enrolled in the program?	None	96 (25.5)	(21.3 - 30.0)	78 (25.4)	(20.8 - 30.5)	18 (25.7)	(16.6 - 36.3)	
	1-2 Sons/daughters	182 (48.3)	(43.3 - 53.3)	142 (46.3)	(40.7 - 51.8)	40 (57.1)	(45.5 - 68.3)	0.265
	3-4 Sons/daughters	85 (22.5)	(18.5 - 27.0)	75 (24.4)	(19.9 - 29.5)	10 (14.3)	(7.6 - 23.9)	
	5-6 Sons/daughters	9 (2.4)	(1.2 - 4.3)	7 (2.3)	(1.0 - 4.4)	2 (2.9)	(0.6 - 8.9)	
	=>7 Sons/daughters	5 (1.3)	(0.5 - 2.9)	5 (1.6)	(0.6 - 3.5)	0 (0.0)	(0.0 - 0.0)	

Sec 2.04. Of your children, how many were under 5 years old?	None	124 (32.9)	(28.3 - 37.8)	102 (33.2)	(28.1 - 38.6)	22 (31.4)	(21.5 - 42.9)	0.535
	1-2 Children	203 (53.8)	(48.8 - 58.8)	161 (52.4)	(46.9 - 58.0)	42 (60.0)	(48.3 - 70.9)	
	3-4 Children	49 (13.0)	(9.9 - 16.7)	43 (14.0)	(10.5 - 18.2)	6 (8.6)	(3.7 - 16.8)	
	5-6 Children	1 (0.3)	(0.0 - 1.2)	1 (0.3)	(0.0 - 1.5)	0 (0.0)	(0.0 - 0.0)	
	=> 7 Children	0 (0.0)	(0.0 - 0.0)	0 (0.0)	(0.0 - 0.0)	0 (0.0)	(0.0 - 0.0)	
Sec 2.05. How many people depended on you, including people outside the household?	0 individuals	58 (15.4)	(12.0 - 19.3)	44 (14.3)	(10.8 - 18.6)	14 (20.0)	(12.0 - 30.3)	0.354
	1-2 individuals	120 (31.8)	(27.3 - 36.7)	95 (30.9)	(26.0 - 36.3)	25 (35.7)	(25.2 - 47.3)	
	3-4 individuals	131 (34.7)	(30.1 - 39.7)	110 (35.8)	(30.6 - 41.3)	21 (30.0)	(20.2 - 41.4)	
	5-6 individuals	41 (10.9)	(8.0 - 14.3)	33 (10.7)	(7.7 - 14.6)	8 (11.4)	(5.6 - 20.4)	
	=> 7 individuals	27 (7.2)	(4.9 - 10.1)	25 (8.1)	(5.5 - 11.6)	2 (2.9)	(0.6 - 8.9)	
Sec 2.06. When you enrolled in the program, did you live with your partner in the same house?	No	115 (30.5)	(26.0 - 35.3)	76 (24.8)	(20.2 - 29.8)	39 (55.7)	(44.0 - 66.9)	0.000
	Yes	262 (69.5)	(64.7 - 74.0)	231 (75.2)	(70.2 - 79.8)	31 (44.3)	(33.1 - 56.0)	
Sec 2.07. Was the partner you lived with the father or mother of your children?	No	25 (6.6)	(4.4 - 9.5)	22 (7.2)	(4.7 - 10.5)	3 (4.3)	(1.2 - 11.0)	0.000
	Yes	175 (46.4)	(41.4 - 51.5)	156 (50.8)	(45.2 - 56.4)	19 (27.1)	(17.8 - 38.3)	
	Missed	177 (46.9)	(42.0 - 52.0)	129 (42.0)	(36.6 - 47.6)	48 (68.6)	(57.1 - 78.5)	
Sec 2.08. When you enrolled in the program, were you living in your own home?	No	185 (49.1)	(44.0 - 54.1)	141 (45.9)	(40.4 - 51.5)	44 (62.9)	(51.2 - 73.5)	0.011
	Yes	192 (50.9)	(45.9 - 56.0)	166 (54.1)	(48.5 - 59.6)	26 (37.1)	(26.5 - 48.8)	
Sec 2.09. If he wasn't in his own house, who paid the rent for the	Own	26 (6.9)	(4.7 - 9.8)	19 (6.2)	(3.9 - 9.3)	7 (10.0)	(4.6 - 18.6)	0.070

house where he lived?	Parents/close relative	44 (11.7)	(8.7 - 15.2)	35 (11.4)	(8.2 - 15.3)	9 (12.9)	(6.6 - 22.1)	
	Not paid	115 (30.5)	(26.0 - 35.3)	87 (28.3)	(23.5 - 33.6)	28 (40.0)	(29.1 - 51.7)	
	Missed	192 (50.9)	(45.9 - 56.0)	166 (54.1)	(48.5 - 59.6)	26 (37.1)	(26.5 - 48.8)	
Sec 2.11. Who paid for your household expenses? Did anyone help you with monthly expenses?	Own	336 (89.1)	(85.7 - 92.0)	281 (91.5)	(88.0 - 94.3)	55 (78.6)	(67.9 - 86.9)	0.001
	Parents/close relative	12 (3.2)	(1.8 - 5.3)	5 (1.6)	(0.6 - 3.5)	7 (10.0)	(4.6 - 18.6)	
	Partner	27 (7.2)	(4.9 - 10.1)	19 (6.2)	(3.9 - 9.3)	8 (11.4)	(5.6 - 20.4)	
	Parents & partner	2 (0.5)	(0.1 - 1.7)	2 (0.7)	(0.1 - 2.1)	0 (0.0)	(0.0 - 0.0)	
Sec 2.12.A. If your partner helped you with some expenses. Mention which expenses he or she helps with: Household expenses	Yes	219 (58.1)	(53.1 - 63.0)	185 (60.3)	(54.7 - 65.6)	34 (48.6)	(37.1 - 60.1)	0.074
	No	158 (41.9)	(37.0 - 46.9)	122 (39.7)	(34.4 - 45.3)	36 (51.4)	(39.9 - 62.9)	
Sec 2.12.B. If your partner helped you with some expenses. Mention what expenses he or she helps with: School: enrollment, transport, school supplies, etc.	Yes	124 (32.9)	(28.3 - 37.8)	101 (32.9)	(27.8 - 38.3)	23 (32.9)	(22.7 - 44.4)	0.995
	No	253 (67.1)	(62.2 - 71.7)	206 (67.1)	(61.7 - 72.2)	47 (67.1)	(55.6 - 77.3)	
Sec 2.12.C. If your partner helped you with some expenses Mention which expenses he or she helps with: Personal expenses: gifts, clothes, travel. Cell phone and credits, etc?	Yes	152 (40.3)	(35.5 - 45.3)	131 (42.7)	(37.2 - 48.3)	21 (30.0)	(20.2 - 41.4)	0.051
	No	225 (59.7)	(54.7 - 64.5)	176 (57.3)	(51.7 - 62.8)	49 (70.0)	(58.6 - 79.8)	
Sec 3.13. When you were enrolled in the program, did you have a confidant?	Yes	363 (96.3)	(94.0 - 97.9)	306 (99.7)	(98.5 - 100.0)	57 (81.4)	(71.2 - 89.2)	0.000
	No	14 (3.7)	(2.1 - 6.0)	1 (0.3)	(0.0 - 1.5)	13 (18.6)	(10.8 - 28.8)	
Sec 3.14. When you were enrolled in the program, did	Partner	239 (63.4)	(58.4 - 68.1)	215 (70.0)	(64.7 - 75.0)	24 (34.3)	(24.0 - 45.9)	0.000

you have a confidant?	Parent/close relative	111 (29.4)	(25.0 - 34.2)	82 (26.7)	(22.0 - 31.9)	29 (41.4)	(30.4 - 53.1)	
	Friend	10 (2.7)	(1.4 - 4.7)	6 (2.0)	(0.8 - 4.0)	4 (5.7)	(2.0 - 13.0)	
	Missed	17 (4.5)	(2.8 - 7.0)	4 (1.3)	(0.4 - 3.1)	13 (18.6)	(10.8 - 28.8)	
Sec 3.15. At the time he enrolled in the program he said he had [insert number of partners] in the last 2 years	<=1 partner	324 (85.9)	(82.2 - 89.2)	259 (84.4)	(80.0 - 88.1)	65 (92.9)	(85.1 - 97.2)	0.065
	=>2 partner	53 (14.1)	(10.8 - 17.8)	48 (15.6)	(11.9 - 20.0)	5 (7.1)	(2.8 - 14.1)	
Pearson chi-square								

Table 3: Logistic regression to estimate sociodemographic predictors of non-disclosure of HIV sero-status among index HIV cases to their sexual partners.

N= 377		cOR 95%CI	p- value	aOR 95%CI	p- value
P01.1. Health Facilities	CS José Macamo	Ref		Ref	
	CS Bagamoyo	0.81 (0.45 - 1.48)	0.499	0.08 (0.02 - 0,38)	0.011
	HG Polana Caniço	0.34 (0.17 - 0.69)	0.003	0.07 (0.01 - 0,30)	0.000
P2.03. Gender	Women	Ref		Ref	
	Men	0.27 (0.14 - 0.52)	0.000	0.38 (0.16 - 0.95)	0.038
P2.01.C_Education grade	No School	Ref			
	Primary	2.32 (0.65 - 8.27)	0.195		
	Secondary	1.78 (0.51 - 6.22)	0.367		
	Superior	2.08 (0.44 - 9.79)	0.353		
P2.04.1. Age_Band	15-24 yr	Ref			
	25-34 yr	0.72 (0.35 - 1.45)	0.354		
	35-44 yr	0.51 (0.23 - 1.16)	0.107		
	45-54 yr	0.80 (0.27 - 2.36)	0.688		
	=>55 yr	0.61 (0.07 - 5.71)	0.668		
P2. 05.C Profission / Source of livelihood	informal employment with minimum and average wage	Ref		Ref	
	Employment contract with maximum wage	2.02 (1.15 - 3.55)	0.015	1.34 (0.61 - 2.94)	0.461
	Jobless with parents financial aid	1.46 (0.65 - 3.24)	0.359	0.64 (0.14 - 2.90)	0.563
P2. 07. Civil Status band	Marital/marriage status	Ref		Ref	
	Single	3.85	0.000	1.56	0.503

		(2.22 - 6.69)		(0.42 - 5.80)	
	Divorced/separated/Widow	2.34 (0.24 - 23.17)	0.466	1.43 (0.10 - 21.43)	0.794
Sec 2. 01. Who did you live with?	Own Family	Ref		Ref	
	Parents	2.30 (1.07 - 4.93)	0.033	0.56 (0.16 - 1.99)	0.373
	Own famly & parents	1.09 (0.57 - 2.07)	0.802	0.70 (0.26 - 1.89)	0.486
	Friends	0.00 (0.00 - 0.00)	0.999	0.00 (0.00 - 0.00)	0.999
	Alone	1.07 (0.12 - 9.45)	0.950	0.71 (0.06 - 8.51)	0.791
	Missed				
Sec 2.02. How many people lived with you including you	<=2 individuals	Ref			
	3-4 individuals	1.37 (0.61 - 3.08)	0.444		
	5-6 individuals	0.91 (0.37 - 2.25)	0.834		
	=> 7 individuals	1.74 (0.69 - 4.35)	0.238		
Sec 2.03. How many sons/daughters did you have when you enrolled in the program?	None	Ref			
	1-2 Sons/daughters	1.22 (0.66 - 2.27)	0.529		
	3-4 Sons/daughters	0.58 (0.25 - 1.33)	0.198		
	5-6 Sons/daughters	1.24 (0.24 - 6.47)	0.800		
	=>7 Sons/daughters	0.00 (0.00 - 0.00)	0.999		
Sec 2.04. Of your children, how many were under 5 years old?	None	Ref			
	1-2 Children	1.21 (0.68 - 2.14)	0.515		
	3-4 Children	0.65	0.379		

		(0.25 - 1.71)			
	5-6 Children	0.00 (0.00 - 0.00)	1.000		
	=> 7 Children				
Sec 2.05. How many people depended on you, including people outside the household?	0 individuals	Ref			
	1-2 individuals	0.83 (0.39 - 1.74)	0.618		
	3-4 individuals	0.60 (0.28 - 1.28)	0.188		
	5-6 individuals	0.76 (0.29 - 2.03)	0.586		
	=> 7 individuals	0.25 (0.05 - 1.20)	0.083		
Sec 2.06. When you enrolled in the program, did you live with your partner in the same house?	No	Ref		Ref	
	Yes	0.26 (0.15 - 0.45)	0.000	0.58 (0.18 - 1.82)	0.347
Sec 2.07. Was the partner you lived with the father or mother of your children?	No	Ref			
	Yes	0.89 (0.24 - 3.27)	0.864		
	Missed	2.73 (2.78 - 9.53)	0.116		
Sec 2.08. When you enrolled in the program, were you living in your own home?	No	Ref		Ref	
	Yes	0.50 (0.29 - 0.86)	0.011	0.59 (0.26 - 1.37)	0.222
Sec 2.09. If he wasn't in his own house, who paid the rent for the house where he lived?	Own	Ref			
	Parents/close relative	0.70 (0.22 - 2.17)	0.535		
	Not paid	0.87 (0.33 - 2.29)	0.784		
	Missed	0.43 (0.16 - 1.11)	0.081		
Sec 2.11. Who paid for your household expenses? Did anyone help you with monthly expenses?	Own	Ref		Ref	
	Parents/close relative	7.15	0.001	8.19	0.018

		(2.19 - 23.36)		(1.44 - 46.46)	
	Partner	2.15 (0.90 - 5.16)	0.086	4.34 (1.05 - 17.17)	0.043
	Parents & partner	0.00 (0.00 - 0.00)	0.999	0.00 (0.00 - 0.0)	1.000
Sec 2.12.A. If your partner helped you with some expenses. Mention which expenses he or she helps with: Household expenses	Yes	Ref			
	No	1.61 (0.95 - 2.70)	0.075		
Sec 2.12.B. If your partner helped you with some expenses. Mention what expenses he or she helps with: School: enrollment, transport, school supplies, etc.	Yes	Ref			
	No	1.00 (0.58 - 1.74)	0.995		
Sec 2.12.C. If your partner helped you with some expenses Mention which expenses he or she helps with: Personal expenses: gifts, clothes, travel. Cell phone and credits, etc?	Yes	Ref			
	No	1.74 (0.99 - 3.04)	0.053		
Sec 3.13. When you were enrolled in the program, did you have a confidant?	Yes	Ref		Ref	
	No	69.79 (8.95 - 544.02)	0.000	0.00 (0.00 - 0.00)	0.999
Sec 3.14. When you were enrolled in the program, did you have a confidant?	Partner	Ref		Ref	
	Parent/close relative	3.17 (1.74 - 5.76)	0.000	8.86 (2.16 - 36.31)	0.002
	Friend	5.97 (1.57 - 22.66)	0.009	21.68 (3.02 - 155.87)	0.002
	Missed	29.11 (8.79 - 96.41)	0.000	0.00 (0.00 - 0.00)	0.999
Sec 3.15. At the time he enrolled in the program he said he had [insert number of partners] in the last 2 years	<=1 partner	Ref			
	=>2 partner	0.42 (0.16 - 1.08)	0.073		
aOR: adjusted Odds ratio					

Figures

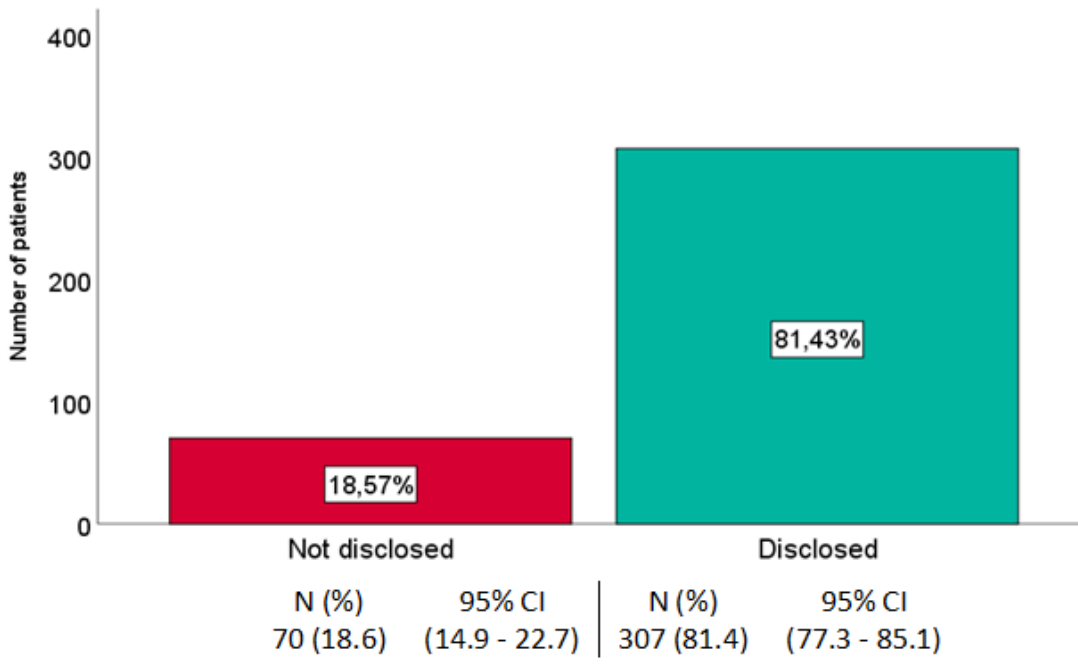


Figure 1

For those have already disclosed their HIV status.