

Original Research Article

## **Predisposing Factors for HIV Infection among Injecting Drug Users in Malindi Sub-County, Kenya**

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### **ABSTRACT**

Injecting drug use (IDU) offers a 100% chance to transmit blood borne infections. There exist scanty reports on factors predisposing IDUs to HIV infection and spread in Malindi Sub-county. IDUs are a potential bridging population in transmission of HIV to the general population. This study determined risk factors predisposing to HIV infection in Malindi. This was a cross-sectional study that involved 211 consented adults age 18 years and above from Malindi Sub-county. Structured questionnaires were used to collect information on risk behaviors and socio-demographic background of the participants using the snowball sampling procedure. About 5ml of venous blood was aseptically drawn into EDTA vacutainer tubes from each participant. The whole blood was separated into plasma which was used for HIV testing using Vironostika HIVAg/Ab protocol. The prevalence of HIV among IDUs was estimated to be 53.1%. Majorities were male (78.9%). About 77.8% received primary education, while a negligible number (1.4%) had tertiary education. There was a significant association between the level of education and HIV infection ( $P < 0.02$ ). A significant majority of IDUs (90.5%) had no spouse; nevertheless, no significant relationship was established between marital status and HIV infection among the IDUs ( $P = 0.114$ ). A significant proportion had other high risk behaviors; MSM (19.9%), CSM (16.6%), needle sharing (48.8%). There was high significant relationship between risky habits and HIV infection ( $P < 0.001$ ). These results show that low level of education, needle sharing and practicing risky sexual habits such as MSM and FSW are the most predisposing factors in HIV infection among IDUs in Malindi.

**Key words:** IDUs, HIV, Risk factors, Malindi.

### **INTRODUCTION**

Injecting drug use is the most efficient way for person to person transmission of HIV. [1] Further to this, IDUs are likely to delay HIV testing exacerbating the situation by transmitting HIV unknowingly. [2] Globally, around 16 million people inject drugs (IDUs) and 3 million of who are living with HIV. [3] The prevalence of HIV infection among IDUs is high in Asia and Eastern Europe and could exacerbate the HIV epidemic in sub-

Saharan Africa. [4, 5] The number of IDUs has been on the rise in Kenya, but there is no data to show the prevalence of HIV-1 infections in this group. [6] Malindi in Kilifi County has high number of injecting drug users in Kenya. [7] Limited data estimates the IDU population at Kenya's coastal region of Mombasa at between 7 to 15% and the national prevalence at 18%, although these numbers may be on the rise. [7] It has been estimated that 17% of new HIV infections at the Kenyan coast

are linked to intravenous drug use. The IDUs also share needles and practice commercial sex. This risky behavior takes place in a setting where about 20% of the general population is estimated to be HIV positive. [8,9] Risky behaviors such as MSM, CSM and needle sharing predispose IDUs to HIV infection in other parts of the world. [10-12] This prompted an urgent study of those risk factors in Malindi, Kenya. In order to evaluate the risk factors predisposing to spread of HIV among the IDUs, we assessed the risky behavioral habits, socio-demographic factors, and prevalence of HIV among 211 IDUs in Malindi.

The number of IDUs in Malindi may have been on the rise, and so is the prevalence of HIV-1 infections in this group. Nevertheless, limited studies reporting high risk factors and behavior that predisposes the IDUs in Malindi to HIV infection and spread exist. IDUs are a potential bridging population in the transmission of HIV to the healthy population. [13-15] There is therefore a need to investigate the predisposing risk factors and habits that may predispose IDUs to HIV infection. Malindi is a tourist town, with most of its revenue coming from tourist attractions and activities. There is high sexual tourism in Malindi, where tourists especially from Italy, Germany and other European Countries frequent. [16] There is therefore need to understand the risk factors and habits that predispose IDUs to HIV infection in Malindi. Also, IDUs may act as a bridge furthering the spread of HIV infections to and from the tourists. [17-19] This study aimed at establishing the prevalence of HIV infection in IDUs and the associated risk factors that predispose IDUs to HIV infection in Malindi Sub County, Kenya. This is significant for the policy makers in the planning for the management of HIV.

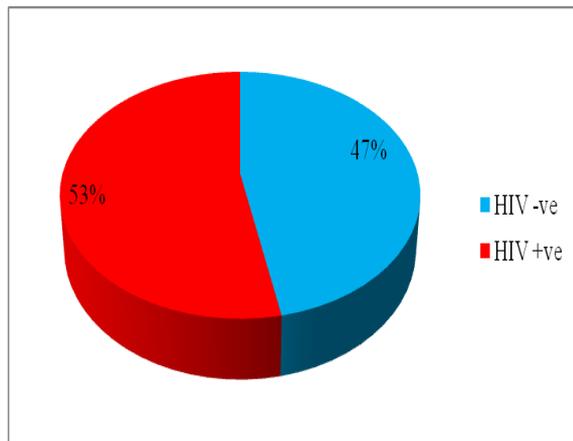
## **MATERIALS AND METHODS**

**Sampling, cohort description:** This was a cross-sectional study that involved 211

consented adults IDUs age 18 years and above in Malindi Sub-county. Snowball sampling procedure was used in this study. This sampling method begins with a set of initial participants referred to as “seed” for an expanding chain of referrals. The seeds were drawn randomly from the population with the assistance of Omari Project in Malindi. Consenting adults aged 18 and above who were active injecting drug users for the past twelve months were included. Structured questionnaire were used to collect data on socio-demographic information and HIV- risk factors. All participants in this study were provided with written informed consent and only those who consented were recruited to participate in this study. Each participant was assigned a confidential identification number. The questionnaires were administered by a qualified counselor in a private room. About 2ml of venous whole blood was aseptically drawn into EDTA vacutainer tubes from each participant upon consent. The whole blood was separated into plasma which was used for serological testing of HIV using Vironostika HIVAg/Ab protocol at KEMRI HIV laboratory. Ethical approval for this study was sought from Scientific Ethical Review Unit (SERU) – KEMRI. Participation was solely voluntary upon consent. Any information related to this study was kept under confidentiality. The obtained data was uploaded and analyzed using SPSS version 20.0. Age, sex, education level, marital status, sex habit, needle sharing and HIV status were used as independent variables. Descriptive statistics were generated using cross tabulations. Chi-square ( $\chi^2$ ) tests were used to establish the relationship between various factors and behaviors predisposing IDUs to HIV infections. The analysis of variance was done using one way ANOVA. The statistical significance was established at 95% confidence limit within a marginal error of 0.05.

## RESULTS

Figure1. Estimated Prevalence of HIV among IDUs in Malindi



**Gender and HIV status:** There were more male IDU participants 156 (73.9%) than female IDU participants 55 (26.1%). (Table1). HIV prevalence was higher in females (33 (60.0%) than the male IDU participants 79 (50.6%). The prevalence of HIV among IDUs in Malindi was estimated to be 53.1% (Figure 1) where

Table2 HIV and Marital Status

HIV Status	Married (%)	Single (%)	Divorced (%)	Total (%)
Positive	7(35.0)	90 (57.0)	15 (45.5)	112(53.1)
Negative	13(65.0)	68 (43.0)	18 (54.5)	99(46.9)
Total	20(9.5)	158 (74.9)	33(15.6)	211 (100)

**Education of IDUs and HIV status:** More than three quarters of the IDUs (77.8%) were only educated up to primary level while a negligible number (1.4%) had tertiary level of education (figure 2). There was a significant relationship between the level of education and HIV status ( $P < 0.02$ ).

### High risk behavior and HIV status

A significant proportion of the IDUs involved in other HIV risky behaviors; IDU and MSM (19.9%), IDU and CSM (16.6%), IDU and needle sharing (48.8%). There was high significant relationship between risky habits and HIV infection ( $P < 0.001$ ); ANOVA test confirmed the

majority of this population had an average age of 21-30 years. However no significant relationship was found between gender and HIV status among the IDUs, ( $p = 0.23$ ).

**Marital status and HIV status:** Significant majority of the participating IDUs had no spouses 191(90.5%) that include singles and divorced. The singles alone were 158(74.9%). The divorced were 33 (15.6%). Only less than one out of ten (9.5%) of the IDUs were married (Table1). It was established that HIV infection was comparatively low among the married couples 7 (35.0%) than the single 90 (57.0%). Nevertheless, there was no statistical significance between marital status and HIV status among the IDUs ( $P = 0.114$ ). This may have partly arisen from the low numbers of married couples in this population (Table 2).

Table1. Marital status of the respondents

Married (%)	Single (%)	Divorced (%)
20 (9.5)	158 (74.9)	33(15.6)

same results ( $P < 0.001$ ) (Table 3 and Table 4).

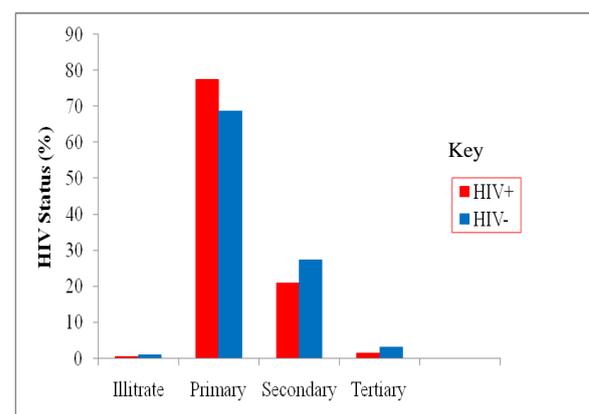


Figure2. Education level and HIV status

Table 3: HIV Status and Sexual Habit

HIV Status	IDU (%)	IDU and CSW (%)	IDU and MSM (%)	CSW (%)	Total (%)
Positive	43 (38.4)	23 (20.5)	38 (33.9)	8 (7.1)	53.1
Negative	77(77.8)	12 (12.1)	4 (4.0)	6 (6.1)	46.1
Total	56.9	16.6	6.6	6.6	100.0

**Table 4: Needle sharing in prison and outside prison**

Needle Sharing	In Prison (%)	Out of Prison (%)
Yes	60 (28.4)	103 (48.8)
No	119 (56.4)	96 (45.5)
No comment	32 (15.2)	12 (5.7)
Total	211 (100.0)	211 (100.0)

## DISCUSSION

The questionnaire was used to collect information on participant Sociodemographic, substance use and injection practices, and sexual behaviors. Sociodemographic characteristics included age, gender, marital status, education. Marital status was classified as single, married and divorced. The categories for education level were primary, secondary, tertiary and illiterate. Sexual behaviors included multiple sexual partners, commercial sex work and sex with the same gender. Needle sharing behavior included in and out of prison and reasons for the needle sharing.

The prevalence of HIV among IDUs in Malindi was estimated to be 53.1%. This result was almost comparable to the result of unrelated study carried out in Thailand among 101 drug injectors which established 52.5% HIV prevalence. [20,21] We established a comparatively low HIV infection among the married couples 7 (35.0%) than the single 90 (57.0%) which may have been partly because of the lower number of the married couples than the unmarried. These results corroborated with the results of a study carried out among IDUs in Taipei, Taiwan which also found a lower HIV infection among the married IDUs 27(13.0%) than the unmarried ones 66 (16.5%). [22] It is therefore suggestive that married IDUs have lower chances of HIV infection than the unmarried ones. The results in Taiwan was in tandem with those found in India by Sravya K *et al* both of which found significant association between marital status and HIV infection among the IDUs. [23] However these results differed with our findings which established no statistical significance between marital status and HIV infection among the IDUs.

Significant majority of IDUs in Malindi had primary level of education 163(77.8%) This study also found that responders who had primary level of education had highest chances of contracting HIV 163(77.3%) followed by secondary 44(20.9%) and tertiary 3(1.4%). There was only one illiterate who was also HIV negative. These results implicate low level of education as a major contributing factor to drug injection and HIV infection. The significant association between the level of education and HIV infection among the IDUs in this study is not surprising since these findings are consistent with the result of a study carried out in Myanmar in 2010 which reported that illiterate or respondents with low level of education were twice likely to be HIV positive. [24] Similarly, studies in Vietnam by Tran T M *et al* found a higher prevalence of HIV infection among those with low education levels. [25] It was also comparable to a study done by Levy JA *et al* in 2007 which revealed significant associations between educational attainment and certain HIV risk behaviors and HIV serostatus. [26] This can be explained in part by the fact that education improves level of HIV awareness and socio-economic status hence improved level of education is likely to reduce injecting drug use and HIV prevalence.

Risky behaviors that predispose IDUs to HIV infection in this study were MSM (19.9%), CSM (16.6%) and needle sharing (48.8%). There was high significant relationship between these risky habits and HIV infection. The results of this study were comparable to the results of unrelated studies which reported an estimated HIV prevalence of 11% to 20% among MSM. [27] A study by Tyndall MW *et al* established HIV prevalence of

32% among female sex workers. [28] The link between substance abuse and sex work is hard to pinpoint though there are a variety of factors that are common to both including homelessness, unstable family lives, socio-economic deprivation, disrupted schooling, poor local authority care and a lack of confidence and self-esteem issues. [29] One study in UK cities found 63% of people who sold sex outdoors did so mainly to pay for drugs. [30]

Brodish P *et al.* 2011 established that between 40% and 50% of IDUs reported needle-sharing in Malindi. [31] Sharing contaminated injecting equipment is the primary mode of HIV transmission in many countries and it is now a major risk factor for the AIDS pandemic. [32] In this study we found that those who utilized used syringes were about 50% likely to be HIV positive. Evidence from other studies has shown the prevalence of HIV was highest among IDUs who reported daily injection and sharing syringes consistently. [33] Needle sharing has therefore remained a major contributing factor to HIV infection among the IDUs as it offer 100% chance of transmission.

## CONCLUSIONS

We observed a high prevalence HIV infection (53.1%) among the IDUs in Malindi Sub County.

The results of this study therefore implicated low level of education, sexual habits such as MSM, CSM and needle sharing as the likely factors to predispose the IDUs to HIV infection ( $P < 0.001$ ). Low level of education is the most contributing factor to heroin injection in Malindi Sub County.

## RECOMMENDATION

It is therefore important for the County Government of Malindi to put in place measures that will reduce and eventually stop these risky habits and promote high level of education among the population.

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