Young Key Populations Left Behind: The Necessity for a Targeted Response in Mozambique

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Abstract

**Background:** The first exposure to high-risk sexual and drug use behaviors often occurs during the period of youth (15-24 years old). These behaviors increase the risk of HIV infection, especially among young key populations (KP) – men who have sex with men (MSM), female sex workers (FSW), and people who inject drugs (PWID). We describe the characteristics of young KP participants in the first round of Biobehavioral Surveillance (BBS) surveys conducted in Mozambique and examine their risk behaviors compared to adult KP.

**Methods:** Respondent-driven sampling (RDS) methodology was used to recruit KP in three major urban areas in Mozambique. RDS-weighted pooled estimates were calculated to estimate the proportion of young KP residing in each survey city. Unweighted pooled estimates of risk behaviors were calculated for each key population group and chi-square analysis assessed differences in proportions between youth (aged less than 24 years old) and older adult KP for each population group.

**Results:** The majority of MSM and FSW participants were young 80.7% (95% CI: 71.5-89.9%) and 71.9% (95% CI: 71.9-79.5%), respectively, although not among PWID (18.2%, 95% CI: 13.2-23.2%). Young KP were single or never married, had a secondary education level or higher, and had lower employment rates. They reported lower perception of HIV risk (MSM: 72.3% vs 56.7%, p<0.001, FSW: 45.3% vs 24.4%, p<0.001), lower HIV testing uptake (MSM: 67.5 vs 72.3, p<0.001; FSW: 63.2 vs 80.6, p<0.001, PWID: 53.3 vs 31.2, p=0.001), greater underage sexual debut (MSM: 9.6 vs 4.8, p<0.001; FSW: 35.2 vs 22.9, p<0.001), and greater underage initiation of injection drug use (PWID: 31.9 vs 7.0, p<0.001). Young KP also had lower HIV prevalence compared to older KP: MSM: 3.3% vs 27.0%, p<0.001; FSW: 17.2% vs 53.7%, p<0.001; and PWID: 6.0% vs 55.0%, p<0.001. There was no significant difference in condom use across the populations.

**Conclusion:** There is an immediate need for a targeted HIV response for young KP in Mozambique so that they are not left behind. Youth must be engaged in the design and implementation of interventions to ensure that low risk behaviors are sustained as they get older to prevent HIV infection.

Background

The period of youth, aged 15-24 years, is a time of significant physical, mental and emotional changes characterized by exploration and inquiry that can establish behaviors that continue into adulthood (1,2). Although they make up 16% of the global population, youth account for one-third of new HIV infections (3,4). One of the core principles of the HIV response for youth is to prioritize those groups that are most vulnerable, including young key populations (KP) – men who have sex with men (MSM), female sex workers (FSW), people who inject drugs (PWID) (2). Young KP are at high risk for HIV infection due to their high risk sexual and drug use behaviors, which often begin during this period (2,3,5). In addition, young KP face social vulnerabilities specific to youth, such as power imbalances and isolation from their social support networks that may increase risk behaviors, such as early sexual debut, unprotected sex, illicit drug use and unsafe drug injection practices (6–8). Stigma and discrimination are often heightened for this age group, who are already impacted by criminalization, but may also experience educational isolation, bullying, harassment and low quality health services (6–8).

The most recent AIDS Indicator Survey (AIS) in Mozambique estimated that youth have an HIV prevalence of 6.9% and they account for more than half of all new infections (9). In addition, HIV testing uptake is low among sexually active youth (young women: 37.6% vs young men 18.2%) (9). Despite this worrying situation, Mozambique does not have a comprehensive strategy to address HIV prevention among young people, although a strategy is being developed addressing school health (10). The National Strategic Plan in Response to HIV/AIDS 2014-2019/2020 identifies adolescent girls and young women (aged 10-24) and their partners, as a priority population, however no policy documents specifically mention the particular vulnerabilities of young KP (11,12).

In this context, the purpose of this secondary analysis is to describe the characteristics of youth KP aged 15-24 who participated in the first round of Bio-Behavioral Surveillance (BBS) surveys conducted in Mozambique and to examine the differences in their risk behaviors compared to adult KP, aged 25 and older. Such data is needed to inform the development of innovative strategies and policies targeted specifically to this sub-group of an already vulnerable population.

Methods

**Survey Design**

The first round of BBS surveys in Mozambique were implemented between 2011-2014 in the country's major urban areas from the three regions: Maputo (MSM, FSW, PWID), Beira (MSM, FSW), Nampula (FSW) and Nampula/Nacala (MSM, PWID). Sampling was done using respondent-driven sampling (RDS), a quasi-probability-based peer-to-peer sampling strategy successfully used to recruit high-risk and hidden populations, whereby participants recruit their peers who meet the enrollment criteria; more information about the survey methodology has been previously published (13-15).

**Study Population**
Slight differences in participant eligibility criteria applied for the three target groups. Individuals were eligible for inclusion in the survey if they were aged 18 years or older (MSM, PWID) or aged 15 years or older (FSW); FSW less than 18 years old were considered emancipated minors and were therefore allowed to provide written informed consent to participate in the survey (13). All participants had to live, work or socialize in the survey area (MSM, FSW, PWID). Specific eligibility criteria included being biologically male and having engaged in oral or anal sex with another male in the 12 months preceding the survey (MSM), being biologically female and having received money in exchange for sex from someone other than a steady partner in the six months preceding the survey (FSW) and reporting ever injecting drugs without a prescription (PWID). All participants had to present a valid referral coupon received by peer who had completed the survey. All participants provided written informed consent for the behavioral questionnaire and biological testing: HIV (MSM, FSW, PWID) and HBV/HCV (PWID). All study protocols were approved by the Mozambican National Bioethics Committee for Health, the Committee on Human Research at the University of California at San Francisco, and the Division of Global HIV/AIDS of the U.S. Centers for Disease Control and Prevention, Atlanta (USA).

### Study Measures and Statistical Analysis

Young KP participants were defined as participants between the ages of 18-24 years old (MSM, PWID) and 15-24 years old (FSW). Analytic variables were chosen based on literature and programmatic importance, and included demographic and health characteristics (marital status, education level, employment, HIV infection, self-reported STIs), HIV-related knowledge and attitudes (experience with stigma, comprehensive HIV knowledge, HIV risk perception), health seeking behaviors (access of health and health services in the last 12 months, HIV test), exposure to high-risk scenarios (physical and sexual violence, binge drinking), sexual risk behaviors (age of sexual debut, age of first sex work experience, multiple and concurrent sexual partners, condom use, receptive and insertive anal sex, payment or receipt of sex in exchange for money or drugs, drug or alcohol use before last sexual encounter), and drug use (age of first illicit drug use, age at first drug injection, daily non-injection and injection drug use, illicit – non injection – drug use, injection drug use, access to clean needles, use of new syringe at last injection). Stigma was assessed by whether one believed they were refused services because of KP status (MSM, PWID). HIV knowledge was evaluated by correctly answering a standardized set of questions from the AIS (9). Access to prevention services was a composite variable defined as having reported interaction with a peer educator, receiving free condoms, lubricants and information education and communication (IEC) materials in the last 12 months. The questionnaires for the three surveys have been previously published (16–18).

RDS-weighted pooled estimates were calculated using the aggregate estimate function of RDS-Analyst to estimate the proportion of young KP residing in each survey city. However, given the low sample size in each survey city population, the KP populations were combined across survey cities to produce unweighted aggregate estimates for further analysis. Unweighted pooled estimates were then used to conduct bivariate analysis using chi-square ($\chi^2$) in order to assess differences in proportions between youth and adult KP; the significance assessed at p<0.05. Descriptive analysis for aggregate age category estimates was conducted using RDS-Analyst and bivariate analyses were conducted using SAS version 9.4 (SAS Institute, Cary, NC, USA).

### Results

The majority of MSM and FSW in the survey cities were young, 80.7% (95% CI: 71.5-89.9%) and 71.9% (95%CI: 71.9-79.5%), respectively, whereas youth accounted for 18.2% (95% CI: 13.2-23.2%) of PWID, as presented in Table 1. Median age of survey participants was 21 (range: 18-59) for MSM, 21 (15-53) for FSW, and 32 (18-60) for PWID. The majority of young KP were single or never married (90.4%, 79.6% and 79.4% for MSM, FSW and PWID, respectively). Among young KP, the majority were male (93.5%). For all three groups, more than two-thirds reported secondary education or higher (MSM: 84.5%, FSW: 70.7%, PWID: 69.6%). About half of MSM participants reported employment (53.1%), compared to one-fifth of FSW who reported work aside from sex work (20.3%); employment was not included in the survey instrument for PWID. Among male survey participants, 34.9% of MSM and 19.8% of PWID reported ever being pregnant. HIV prevalence was estimated at 3.3% for young MSM, 17.2% for young FSW and 6.0% for young PWID. Self-reported sexually transmitted infection (STI) was lower for MSM (11.2%) compared to both FSW (31.4%) and PWID (34.8%).

#### Young MSM

Results from the unweighted pooled bivariate estimates of risk factors among young MSM are presented in Table 2. Younger MSM were more likely to be single compared to older MSM (90.4% vs 59.3%, p<0.001) and to have a secondary education level or higher (84.5% vs 79.1%, p=0.028); however, there were lower rates of current employment (53.1% vs 85.5%, p<0.001). Compared to adult MSM, young MSM reported greater stigma (9.9% vs 5.7%, p=0.026) and lower health seeking behaviors in the last 12 months (p=0.001). More youth had a low perception of their HIV risk (72.3% vs 56.7%, p<0.001), and more reported never having an HIV test (p=0.001); there was no difference found in comprehensive HIV knowledge between the two groups. HIV prevalence were lower among youth 3.3% vs 27.0% (p<0.001), and the same dynamic was observed for self-reported STIs: 11.2% vs 20.5% (p=0.001). Young MSM also reported less binge drinking behaviors (31.6% vs 43.8%, p<0.001) and less illicit drug use in the past 12 months (8.9% vs 12.8%, p=0.045). Regarding sexual risk behaviors, more young MSM reported their first anal sexual encounter with a man having occurred before the age of 15 years old: 9.6% vs 4.8% (p=0.023); they also reported less experiences of paying or receiving money in exchange for sex (42.8% vs 51.2%, p=0.01). The results did not show a difference in circumcision rates, access to comprehensive prevention services, physical or sexual violence, number of anal sex male partners, receptive and insertive anal sex, or non-condom use.
Table 3 presents the socio-demographic and behavioral risk factors of adolescent and young FSW participants compared to the older adult participants. Among FSW participants, more young FSW reported being single or never married (79.4% vs 54.0%, p<0.001) and more also reported having a secondary education level or higher (69.6% vs 54.4%, p=0.008); less young FSW reported a history of arrest (44.6% vs 71.8%, p<0.001). Never having had an HIV test was reported by more young FSW compared to older FSW (46.7% vs 28.8%, p=0.001); they had much lower HIV prevalence (6.0% vs 55.0%, p<0.001), although there was no difference in HIV risk perception (34.3% vs 40.6%, p=0.340). Self-reported STI infection was greater among youth FSW compared to older adults (34.8% vs 21.3%, p=0.006). Less young FSW reported not having access to comprehensive prevention services (76.1% vs 86.0%, p=0.019). More young FSW reported having multiple sexual partners in the past year (77.3% vs 53.7%, p<0.001), although there was no difference in condom use at last sexual encounter (47.8% vs 42.6%, p=0.627). More young FSW reported first illicit drug use experience and first injection drug experience before the age of 18 years old, 61.5% vs 34.7% (p<0.001) and 31.9% vs 7.0% (p<0.001), respectively. They reported less daily illicit (non-injection) drug use (12.2% vs 73.9%, p<0.001) and less daily injection use (12.2% vs 73.9%, p<0.001). There was no significant difference between access to new syringes and use of new syringes at last injection.

Discussion

About a quarter of the adult population in Mozambique is between the ages of 15-24 years old, although the overwhelming majority of MSM and FSW in the surveyed cities are estimated to be youth: 81% and 72%, respectively (19,20). The younger profile of MSM is consistent with what has been observed in the literature (21–24), while the age distribution of FSW varies by context (25–28). The proportion of young PWID is consistent with the youth demographic in the general population (20); the older age profile of PWID is also consistent with literature from the region (29–32). Unweighted pooled estimates presented across the three populations demonstrate that youth were generally single or never married and had higher education level, which is consistent with the general population (9). Young MSM and FSW reported greater unemployment than the adult KP population, which is similar to the general population (9).

Stigma was only assessed for MSM and PWID and show greater experiences among young MSM; there was also no difference in stigma among PWID. Other studies and systematic reviews point to the role of stigma on risk behaviors and low health seeking behaviors, where youth fear discrimination from health care workers, family, community members, teachers and classmates (33,34).

Across all three populations, young KP had a lower perception of their HIV risk and lower comprehensive knowledge. Compared to the general population, comprehensive knowledge of HIV among young KP was higher than that among youth aged 15-24 (MSM: 53.3%, FSW: 53.3% compared to Young men: 30.8% and Young women: 30.2%) (9). Perhaps not surprisingly, although young KP reported less HIV testing than the adults across the three populations, they reported greater HIV testing than their counterparts in the general population, where close to three-fifths of young women reported a previous HIV test and less than a third of young men (9). Both comprehensive knowledge and HIV testing demonstrate that young KP are more aware of their risk compared to their counterparts in the general population. Estimated HIV prevalence among young MSM (3.3%) is similar to their counterparts in the general population (3.2%), however young FSW have almost double HIV prevalence compared to women in their same age group: 9.8% vs 17.2%. HIV prevalence among youth PWID (6.0%) - the majority of whom were male - was higher than among male youth in the general population (3.2%) (9).

Alarmingly high proportions of young KP reported not having access to prevention services in the last 12 months, although only statistically significant among PWID. This finding, coupled with low comprehensive HIV knowledge and low testing uptake, highlight that young KP have not been empowered to take charge of their own health of HIV prevention. This is particularly worrying for FSW, close to two-thirds of whom report ever being pregnant and risk transmitting HIV vertically to their children (35). This calls for enhance youth-specific HIV interventions, using peer educators, mobile technology and social media (5,36). Other clinical innovations, such as HIV self-testing (HIVST), may be important for this age group, which are needed to address the low testing rates across all three KP groups. For example, a study in Uganda found that MSM preferred
Conclusions

Mozambique and reinforces the importance of early interventions in order to promote lifelong health status.

Despite these limitations, this is the only available study examining the sexual risk and drug use behaviors of young key populations in Mozambique, and it highlights the importance of understanding the unique vulnerabilities and risk factors that young key populations face. The study found that young PWID have more problematic sexual risk behaviors than their older counterparts, where greater proportions report multiple sexual partners, drug or alcohol use before their last sexual encounter and greater self-reported STIs. These risk behaviors illustrate the compounded risk pathways of HIV transmission due to both sexual risk and injection drug use behaviors. Of note, KP across all three populations report higher condom use at their last sexual encounter compared to the general population (MSM: 73.3%, FSW: 75.5% with client and 54.9% with non-client partner, PWID: 52.2% vs young women: 42.0% and young men: 39%), highlighting the impact of condom promotion interventions among these high-risk groups.

As observed in other studies, the results display that risk behaviors begin at younger ages, such as earlier sexual debut (MSM, FSW) and earlier drug use and injection drug use experiences among PWID (21,33). Prolonged exposure can eventually lead to adverse health outcomes such as HIV and STI infection, emphasizing an urgent need to prevent and/or reinforce healthy preventative behaviors over time into adulthood. That younger PWID report daily injection use at lower rates than adults represents a prime opportunity for intervention before more adverse injection behaviors are adopted.

Any analyses of youth KP must also address the intersectionality of risk profiles. As observed, 8.9% of young MSM were (non-injection) drug users and 15.2% of young PWID reported receiving sex in exchange of drugs. Evidence of overlapping risk profiles has been explored in different contexts and requires a person-centered approach to interventions (6,39).

Various social and structural barriers contribute to the heightened vulnerabilities of young KP. For example, young FSW reported higher levels of sexual and physical violence in the past 12 months compared to their older counterparts. This is likely due to unequal power dynamics and patriarchal social structures. Similarly, although young PWID report lower experience with arrest compared to adults, close to half reported a history of arrest thus underscoring the criminalization of addiction.

Thus, both behavioral and structural interventions are of paramount importance and the participatory engagement of youth in the design and implementation of programming for a targeted response cannot be ignored (2,24,38,40–42). UNAIDS outlines the importance of capacity building initiatives of youth-led organizations and associations to ensure their ability to mobilize and advocate for their peers (3). This can include practical skills, such as capacity building in grant development, human and financial resource management and systems for monitoring and evaluating the reach and impact of programming. In addition, interventions must address the intra- and interpersonal factors contributing to high risk behaviors in KP youth such as low self-esteem, loneliness and perceived lack of social support (43). Structural interventions must also address the particular vulnerabilities of young KP such as keeping girls in school, creating employment opportunities, the decriminalization of drug addiction, and should promote human rights (3). These approaches must include a coordinated response with civil society organizations and the various government sectors responsible for youth programming, most notably Health, Education and Human Development, and Youth and Sports.

Finally, it is very difficult to track and analyze the HIV epidemic among the adolescent population in general, and young KP specifically, however efforts are often hindered by limited health information systems (2). Mozambique’s current national health information system disaggregates by KP status, however it is not possible to disaggregate further by age, consequently, the national response is unable to track the HIV epidemic among adolescents and cannot monitor health outcomes for this age group, such as viral suppression or vertical transmission rates among young women. As the youth population continues to grow, so too does the risk of HIV infection among young KP if targeted efforts are not urgently adopted. As an illustration, population growth among youth aged 15-24 in Mozambique resulted in an additional 53,000 new infections between 2010-2017 (35).

Although this is the first analysis of young KP in Mozambique, there are several limitations to be discussed. First, this analysis is subject to the general limitations of RDS surveys such as selection bias in peer-referral sampling methods, recall bias, and social desirability bias. Next, given the small sample size, the bivariate analysis was conducted on unweighted aggregate estimates, which removed social networks and chains, and therefore the results may not be generalizable to KP and simply represent the survey participants. In addition, the study was not powered to compare youth and adult KP so true associations may not have been captured. Finally, the ability to compare across KP groups was limited by the survey measures. Although the survey instruments were largely consistent across the three populations, some key variables were missing such as stigma estimates for FSW and employment, comprehensive HIV knowledge, binge drinking, and age of sexual debut for PWID.

Despite these limitations, this is the only available study examining the sexual risk and drug use behaviors of young key populations in Mozambique and reinforces the importance of early interventions in order to promote lifelong health status.
This analysis points to the need for targeted strategic participatory approaches to address the specific risk profile of young key populations, specifically for FSW and PWID. Given the HIV epidemic in Mozambique, and the large demographic of youth, issues in adolescent and youth health must be addressed to guarantee that these groups are not left behind in the HIV response and are able to maintain healthy behaviors into adulthood.

Abbreviations

AIS: AIDS Indicator Survey
BBS: Biobehavioral Survey
KP: Key populations
FSW: Female sex workers
HIV: Human immunodeficiency virus
MSM: Men who have sex with men (MSM),
PWID: People who inject drugs (PWID),
RDS: Respondent-driven sampling
RDS-A: RDS-Analyst

Declarations

Ethics approval and consent to participate

All study protocols were approved by the Mozambican National Bioethics Committee for Health, by the Committee on Human Research at the University of California at San Francisco, and by the Division of Global HIV/AIDS of the U.S. Centers for Disease Control and Prevention, Atlanta. Written informed consent was obtained from all participants; Female Sex Worker survey less than 18 years old were considered emancipated minors and were allowed to provide written informed consent for participation.

Consent for Publication

Not Applicable

Availability of data and materials

The dataset analysed for the current study are fully available from the Data Management Unit of the Mozambique National Institute of Health (INS) data repository for researchers who meet the criteria for access to confidential data following the submission of a concept note. For information, please visit: www.ins.gov.mz or contact: secretaria@ins.gov.mz.

Competing Interests

The authors declare that they have not competing interests.

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Authors’ Contributions

All authors reviewed and provided edits and comments on manuscript drafts. In addition, authors had the following responsibilities: MASB had full access to the data, conducted data analysis, drafted and revised the manuscript, and takes responsibility for the integrity of the data, accuracy of the data analysis and contents of this article; CSB was involved in BBS recruitment and implementation activities and provided scientific oversight; IS was involved in BBS recruitment, data management and data analysis; HFR designed the study, was the BBS principal investigator, and was involved in recruitment, scientific oversight and data analysis. EF, M, SL provided critical revision and final approval of the manuscript. All authors read and approved the final version of the manuscript.
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Tables

Table 1: Aggregate RDS-weighted estimates of adolescents and young people among MSM, FSW and PWID, Mozambique, 2011-2014.
|          | Maputo | Beira* | Nampula/Nacala | Total |
|----------|--------|--------|----------------|-------|
| n/N:     | 385/496 | 456/583 | 293/353       | 1134/1432 |
| %: Crude | 77.6   | 78.2   | 83.0           | 79.2   |
| RDS-weighted | 79.6   | 79.2   | 85.5           | 80.7   |
| (95% CI)  | (65.4-93.9) | (73.3-85.0) | (80.6-90.5)  | (71.5-89.9) |
| n/N:     | 238/400 | 317/411 | 333/429       | 888/1240 |
| %: Crude | 59.5   | 77.1   | 77.6           | 71.6   |
| RDS-weighted | 65.0   | 78.8   | 78.6           | 71.9   |
| (95% CI)  | (50.2-79.7) | (72.6-85.0) | (72.7-84.4)  | (64.3-79.5) |
| n/N:     | 37/353  | 55/139  | 92/492        | 18.7   |
| %: Crude | 10.5   | 39.6   | 18.2          |       |
| RDS-weighted | 11.9   | 38.5   |          (13.2-23.2) | |

Note: Men who have sex with men (MSM), age 18-24; Female sex workers (FSW), age 15-24; People who inject drugs (PWID), age 18-24

* The BBS among PWID was not conducted in Beira

Table 2: Socio-demographic and Behavioral Risk Factors of Young (18-24 year old) and Older Adult (25+) Men who have sex with men (MSM) participants, Mozambique 2012
|                                      | 18-24 |   | 25+ |   | p-value  |
|--------------------------------------|-------|---|-----|---|----------|
|                                      | n     | % | n   | % |          |
| Single or never married              | 1022  | 90.4 | 176 | 59.3 | <0.001   |
| Secondary education level or higher  | 956   | 84.5 | 235 | 79.1 | 0.028    |
| Currently employed                   | 601   | 53.1 | 254 | 85.5 | <0.001   |
| Uncircumcised                       | 395   | 34.9 | 115 | 38.7 | 0.221    |
| Experienced stigma in the last 12 months | 112 | 9.9 | 17 | 5.7 | 0.026 |
| Did not seek health services in the last 12 months | 604 | 53.4 | 126 | 42.4 | 0.001 |
| Low perception of HIV risk\(^a\)     | 790   | 72.3 | 157 | 56.7 | <0.001   |
| Lack of comprehensive HIV knowledge | 529   | 46.7 | 134 | 45.1 | 0.620    |
| Never had HIV test                   | 481   | 42.5 | 82  | 27.7 | <0.001   |
| HIV infection                        | 36    | 3.3  | 78  | 27.0 | <0.001   |
| Self-reported STI                    | 127   | 11.2 | 61  | 20.5 | <0.001   |
| No access to comprehensive prevention services\(^b\) | 760 | 67.1 | 202 | 68.0 | 0.775 |
| Binge drinking                       | 347   | 31.6 | 126 | 43.8 | <0.001   |
| Illicit drug use in the last 12 months | 101 | 8.9 | 38  | 12.8 | 0.045 |
| Physical Violence in the last 12 months | 43  | 3.8 | 8   | 2.7  | 0.366 |
| Sexual Violence in the last 12 months | 14  | 1.2 | 4   | 1.4  | 0.776 |
| Less than 15 years old at first anal sexual experience | 108 | 9.6 | 14  | 4.8  | 0.023 |
| 2+ male anal sex partners\(^c\)      | 494   | 45.6 | 138 | 48.3 | 0.426    |
| Concurrent male and female sexual partner in the last 12 months | 560 | 49.5 | 176 | 59.3 | 0.003 |
| Receptive anal sex in the last 12 months | 411 | 36.3 | 112 | 37.7 | 0.655 |
| Insertive anal sex in the last 12 months | 967 | 85.4 | 252 | 84.9 | 0.803 |
| No Condom use at last sexual encounter | 304 | 27.0 | 96  | 32.5 | 0.060 |
| Paid or received sex in exchange for money in the last 12 months | 484 | 42.8 | 152 | 51.2 | 0.010 |

*Significance level assessed at p<0.05

\(^a\) Analysis excludes those with knowledge of HIV-positive status;

\(^b\) Contact with a peer educator and received free condoms, lubricants, and Information education and communication (IEC) materials;

\(^c\) Analysis only includes MSM who reported anal sex in last 12 months

Table 3: Socio-demographic and Behavioral Risk factors of Young (15-24 year old) and Older Adult (25 years and older) Female Sex Workers (FSW) participants, Mozambique 2011-2012
### Table 4: Socio-demographic and Behavioral Risk factors of Young (15-24 year old) and Older Adult (25 years and older) People who inject drugs (PWID) participants, (n=492), Mozambique 2014

|                                | 18-24 | 25+ | p-value |
|--------------------------------|-------|-----|---------|
|                                | n     | %   | n       | %   |        |
| Single or never married        | 705   | 79.6| 93      | 26.5| <0.001 |
| Secondary education level or higher | 626   | 70.7| 153     | 43.6| <0.001 |
| Work aside from sex work       | 180   | 20.3| 114     | 32.5| <0.001 |
| Ever Pregnant                  | 529   | 59.71|327     | 93.16| <0.001 |
| Low perception of HIV risk     | 361   | 45.3| 79      | 24.4| <0.001 |
| Lack of comprehensive HIV knowledge | 414   | 46.7| 143     | 40.7| 0.056  |
| Never had HIV test             | 326   | 36.8| 68      | 19.4| <0.001 |
| HIV infection                  | 152   | 17.2| 189     | 53.7| <0.001 |
| Self-reported STI, last 12 months | 279   | 31.4| 117     | 33.2| 0.536  |
| No access to comprehensive prevention services | 766   | 86.5| 264     | 75.2| <0.001 |
| Did not seek health services in the last 12 months | 567   | 64.0| 180     | 51.3| <0.001 |
| Binge drinking                 | 216   | 24.4| 118     | 33.7| 0.001  |
| Illicit drug use in the last 12 months | 17    | 1.9 | 7      | 2.0 | 0.931  |
| Physical Violence in the last 12 months | 135   | 15.3| 37      | 10.6| 0.031  |
| Sexual Violence in the last 12 months | 111   | 12.5| 27      | 7.7 | 0.016  |
| Less than 15 years old at first sexual experience | 310   | 35.2| 78      | 22.9| <0.001 |
| Less than 15 years old at first sex work experience | 111   | 12.6| 15      | 4.4 | <0.001 |
| Ever had anal sex              | 180   | 20.3| 90      | 25.6| 0.041  |
| No Condom use at last sexual encounter, with client | 217   | 24.5| 99      | 28.3| 0.172  |
| No Condom use at last sexual encounter, with non-client partner | 156   | 45.1| 58      | 55.8| 0.056  |

a Analysis only includes FSW with non-client partners

b Contact with a peer educator and received free condoms, lubricants, and Information education and communication (IEC) materials
|                                      | 18-24 |   % | 25+ |   % |        |
|--------------------------------------|-------|-----|-----|-----|--------|
| Male                                 | 86    | 93.5| 381 | 95.3| 0.485  |
| Single or never married              | 73    | 79.4| 216 | 54.0| <0.001 |
| Secondary education level or higher  | 64    | 69.6| 217 | 54.4| 0.008  |
| Uncircumcised                        | 17    | 19.8| 143 | 37.5| 0.003  |
| History of arrest                    | 41    | 44.6| 287 | 71.8| <0.001 |
| Low perception of HIV risk\(^a\)     | 25    | 34.3| 84  | 40.6| 0.340  |
| Never HIV Test                       | 43    | 46.7| 115 | 28.8| 0.001  |
| HIV infection                        | 5     | 6.0 | 199 | 55.0| <0.001 |
| Self-reported STI                    | 32    | 34.8| 85  | 21.3| 0.006  |
| Did not seek health services         | 54    | 58.7| 253 | 63.3| 0.416  |
| No access to comprehensive prevention services\(^b\) | 70    | 76.1| 344 | 86.0| 0.019  |
| Physical Violence\(^a\)              | 18    | 19.6| 59  | 14.8| 0.252  |
| Sexual Violence\(^a,b\)              | 3     | 3.3 | 3   | 0.8 | 0.082  |
| Experienced stigma\(^a\)             | 17    | 19.3| 67  | 17.5| 0.687  |
| 2+ sexual partners, last 12 months   | 68    | 77.3| 211 | 53.7| <0.001 |
| No condom use at last sexual encounter| 44   | 47.8| 170 | 42.6| 0.627  |
| Drugs or alcohol use before last sexual encounter | 13 | 15.1 | 76 | 19.8 | 0.415 |
| Received drugs in exchange for sex   | 14    | 15.2| 53  | 13.3| 0.626  |
| Less than 18 years old at first drug use | 56   | 61.5| 136 | 34.7| <0.001 |
| Less than 18 years old at first injection use | 29   | 31.9| 27  | 7.0 | <0.001 |
| Daily drug use (including non-injection drugs) | 40   | 12.2| 289 | 73.9| <0.001 |
| Daily injection drug use             | 27    | 29.4| 248 | 62.0| <0.001 |
| No access to new syringes            | 16    | 17.4| 50  | 12.5| 0.218  |
| No use of new syringe at last injection | 26   | 30.2| 148 | 39.1| 0.127  |

\(^a\)Analysis excludes those with knowledge of HIV-positive status;

\(^b\)Contact with a peer educator and received free condoms, lubricants, and Information education and communication (IEC) materials;