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Factors associated with unsafe sex among Kenyan youth: Results from a nationally representative population-based survey

Mary Mwangi[1,*], **Anthony Waruru**[1], **Wanjiru Waruiru**[2], **Anthony Gichangi**[1], **Cathy Toroitich-Ruto**[1], and **Andrea A. Kim**[1]

[1]Divison of Global HIV/AIDS, US Centers for Disease Control and Prevention, Nairobi, Kenya

[2]Institute for Global Health Sciences, University of California, San Francisco, California, United States of America

Abstract

BACKGROUND—Understanding sexual risk among youth can inform the design of effective HIV prevention interventions.

METHODS—The 2012 Kenya AIDS Indicator Survey was a nationally representative population-based survey. We administered a questionnaire and collected blood samples for HIV testing. We examined factors associated with unsafe sex among unmarried youth aged 15–19 and 20–24 years.

RESULTS—Of 2,090 unmarried youth aged 15–19 years, 33.3% (95% confidence interval [CI] 30.6–36.1) had ever had sex. Among those, 66.0% (95% CI 61.3–70.7) had sex in the past year (sexually active), and of these, 38.7% (95% 33.4 –44.0) reported unsafe sex. No differences were observed in unsafe sex by sex. Factors associated with increased adjusted odds of unsafe sex among youth aged 15–19 years were residence in Central province; having primary or lower education; sexual debut before age 15 years; ever receiving money, gifts or favours for sex (transactional sex); multiple sexual partners in the past year; and low self-perceived risk of HIV. Of the 1,079 unmarried youth aged 20–24 years, 77.2% (95% CI 74.2–80.2) had ever had sex. Of these, 73.1% (95% CI69.8–76.3) were sexually active, and 24.1% (95% CI 18.1–30.1) of women and 31.9% (95% CI 26.4–37.5) of men reported unsafe sex in the past year. Factors associated with increased adjusted odds of unsafe sex among youth aged 20–24 years were primary or lower education, transactional sex and multiple partners in the past year.

CONCLUSION—Unsafe sex is common among Kenyan youth, especially those aged 15–19 years. HIV prevention efforts need to target youth, support educational progression and economic empowerment.

[*]Corresponding author: hoh7@cdc.gov.

AUTHOR CONTRIBUTIONS

MM contributed in the survey design and implementation, conceptualized and wrote the manuscript. WW, AG, and CT provided technical support in the survey design and implementation and reviewed manuscript drafts. AW and AK provided technical support in the survey design and implementation, conducted statistical analysis and reviewed manuscript drafts. AK provided input in manuscript writing.

CONFLICT OF INTEREST

The authors declare that they have no competing interests. The findings and conclusions in this paper are those of the author(s) and do not necessarily represent the official position of the U.S. Centres for Disease Control and Prevention and the Government of Kenya.

Keywords

Unsafe sex; youth; HIV; population-based survey; Kenya

BACKGROUND

A key objective of the global response to HIV is to prevent new HIV infections. It is estimated that young people aged 15–24 years account for 40% of new HIV infections among individuals aged 15 years and above (World Health Organization-WPRO, 2015). In 2013, there were 250,000 new HIV infections among adolescents with two-thirds occurring among adolescent girls (Joint United Nations Program on HIV/AIDS, 2015).

Most of the sexual behaviours that put individuals at risk for HIV are initiated during adolescence or young adulthood, highlighting the important role of young persons in the HIV epidemic. Interventions that target risky sexual behaviours among youth form a critical component of national strategies to prevent HIV among young people in sub-Saharan Africa (Stockl, Karla, Jacobi, & Watts, 2013; Doyle, Mavedzenge, Plummer, & Ross, 2012; Rositich, Cherutich, Brentlinger, Kiarie, Nduati, & Farquhar, 2012; Pettifor, O'Brien, Macphail, Miller, & Rees, 2009). In addition, global initiatives, such as the US President's Emergency Plan for AIDS Relief DREAMS Initiative, have recently focused on addressing the factors that influence HIV behavioural risk among girls and young women as an essential component in controlling the HIV epidemic (United States President's Emergency Plan for AIDS Relief, n.d.). With 70% of the population in sub-Saharan Africa under the age of 30 years as of 2010 (United Nations Economic Commission for Africa & United Nations Programme on Youth, n.d.), targeting the HIV prevention response to youth will be key to curbing the epidemic in the region.

While there is limited evidence on the effectiveness of behavioural interventions among youth (Michielsen, 2012; Michielsen, Chersich, Luchters, Ronan Van Rossem, & Temmerman, 2010), carefully designed school– and community-based behavioural interventions can promote safer sexual behaviours (Chin, Sipe, Elder, Mercer, Chat–topadhyay, Jacob, et al., 2009; Crepaz, Marshall, Aupont, Jacobs, Mizuno, Kay, et al., 2009; Darbes, Crepaz, Lyles, Kennedy, & Rutherford, 2008; Kirby, Obasi, & Laris, 2006; Gallant, & Maticka-Tyndale, 2004). Participation in school-based sex education and HIV prevention programmes has been associated with delayed sexual debut especially among girls, reduced pregnancy rates and lowered the frequency of risky sexual behaviours (Coates, Richter, & Caceres, 2008; Kirby, 2002). Additionally, there is evidence that keeping girls in school reduces risky sexual behaviours and the risk of getting HIV infection (Pettifor, Levandowski, MacPhail, Padian, Cohen, & Rees, 2008).

In Kenya, behaviour change interventions for unmarried and non-cohabiting youth primarily focus on sexual abstinence, delaying sexual debut, correct and consistent condom use, reduction of multiple sexual partners, and promoting effective parent–child communication on sexuality and high–risk sexual behaviours (Kenya Ministry of Health, n.d.). However, the impact of such programmes in behaviour change modification among young people has not been measured systematically. Nationally representative data on the frequency and trend in

sexual behaviours of young people can provide insight on the effectiveness of youth behaviour change interventions and considerations for future targeted programmes for this population.

In 2012–2013, Kenya conducted a second AIDS Indicator Survey (KAIS 2012) to provide nationally representative population-based data to inform strategies for the national response on HIV prevention, care and treatment for the Kenyan population (National AIDS/STIControl Program, 2013). This paper describes the sexual behaviours of unmarried and non-cohabiting young people aged 15–24 years participating in the KAIS 2012, describes differences in sexual behaviours as measured in the first and second Kenya AIDS Indicator Surveys (National AIDS/STI Control Program, 2009; 2013) and examines factors associated with unsafe sex in this sub-population.

METHODS

Study design

KAIS 2012 was a nationally representative cross-sectional population-based survey of persons aged 18 months to 64 years. A two-stage cluster sampling design provided representative estimates of HIV-related indicators. In the first stage, clusters were randomly sampled from the Kenya National Bureau of Statistics national household sampling frame; in the second stage, 25 households were selected using systematic probability sampling. Eligible households and persons within these households who met the inclusion criteria were selected to participate in the survey. The detailed methods of this study are described elsewhere (Waruiru, Kim, Kimanga, Ng'ang'a, Schwarcz, Kimondo, et al., 2012). In this paper, we restrict our analysis to unmarried non-cohabiting young people aged 15–24 years.

Data collection procedures

A standardized questionnaire was administered to young people aged 15–24 years. The questionnaire collected information on socio-demographic characteristics; age at sexual debut; knowledge about where to get condoms; sexual activity in the past year; sexual partners including number of lifetime sexual partners; condom use with sexual partners; knowledge of HIV status of sexual partners; sex in exchange for favours, gifts or money; HIV testing behaviour; and male circumcision. Participants provided a blood sample for HIV testing at a central laboratory and were offered home-based testing and counselling to learn their HIV status using a rapid HIV testing algorithm based on national guidelines (NASCOP, 2010).

Measurements

A wealth index variable served as a measure of household wealth based on household characteristics (Rutstein & Johnson, 2004). Early sexual debut was defined as first sexual intercourse before the age of 15 years. Respondents who reported having had sex in the last 12 months were defined as being sexually active. Respondents who had ever had sex were asked if they knew the HIV status of their sexual partners in the past 12 months. If they knew the HIV status of their partners, they were asked to disclose their partner's HIV status. Those who self-reported unprotected sexual intercourse with a partner of unknown or known

sero–discordant HIV status (based on respondent's laboratory confirmed HIV test result and self-reported partner HIV status) were considered to have engaged in unsafe sex.

Statistical analysis

We stratified our analysis by two age groups, 15–19 years and 20–24 years. We conducted univariate analysis to describe socio-demographic and behavioural characteristics. Bivariate and multivariate analyses were conducted to identify socio-demographic, behavioural, and biologic factors associated with unsafe sex. The multivariate models included variables associated with unsafe sex in the bivariate analyses at a p–value < 0.25 and other variables that were potential confounders or were known to be associated with unsafe sex. We present proportions, odds ratios (OR), adjusted odds ratios (AOR), and their 95% confidence intervals (CI). Variables that remained in the models at a p–value <0.05 were considered statistically significant. We also assessed temporal changes in select sexual behaviours based on data from the KAIS 2007 and KAIS 2012. Z–tests were conducted to test for statistical significance (defined as p–value < 0.05) in differences observed between young people in the two age groups in the two surveys. All analyses were conducted in SAS version 9.3 (SAS Institute Inc., Cary, North Carolina, USA) and took into account stratification and clustering in the survey design. Estimates were weighted to account for sampling probability and adjusted for survey non-response.

Ethical considerations

The KAIS 2012 protocol was reviewed and approved by the Institutional Review Boards of the Kenya Medical Research Institute and the U.S. Centres for Disease Control and Prevention and by the Committee on Human Research of the University of California, San Francisco. For those aged 15–17 years, parental/guardian consent and minor assent were obtained before administering the questionnaire. Young people aged less than 18 years who were pregnant, married, or had children were regarded as mature minors and provided their own informed consent, as did those aged 18–24 years. Survey staff were trained on how to refer young people for counselling services and the importance of maintaining confidentiality.

RESULTS

Socio-demographic characteristics

There were 4,541 youth aged 15–24 years who completed interviews and of these, 2,292 were aged 15–19 years, and 2,249 were aged 20–24 years. Among those 15–24 years old, 3,169 (72.0%, 95% CI 69.9–74.2) had never been married or cohabited with a partner. Of the 2,292 young people aged 15–19 years who completed interviews, 2,090 (92.3%, 95% CI 90.8–93.8) had never been married or cohabited with a partner, and of these 1,032 (43.0%, 95% CI 40.3–45.7) were females and 1,466 (71.1%, 95% CI 67.1–75.1) resided in rural areas (Table 1). Over forty percent had either completed primary or secondary education.

Of the 2,249 respondents aged 20–24 years who completed interviews, 1,079 (51.2%, 95% CI 48.2–54.2) had never been married or cohabited with a partner. Of these, 431 (33.7%,

95% CI 30.2–37.1) were females and 53.3% (95% CI 48.5–58.0) resided in rural areas while 70.5% (95% CI 66.8–74.1) had completed secondary education (Table 2).

Sexual behaviours of young people aged 15–19 years

Among those aged 15–19 years, males (37.9%, 95% CI34.2–41.6) were more likely than females (27.3%, 95% CI23.8–30.7) to have ever had sex (Table 1). Males (39.7%, 95% CI 33.5–45.8) were also more likely than their female counterparts (24.9%, 95% CI 19.0–30.9) to report early sexual debut.

Among those who had ever had sex, 66.0% (95% CI61.3–70.7) were sexually active in the past year. Of these,22.3% (95% CI 16.9–27.8) of males and 6.0% (95% CI 2.2–9.9) of females reported two or more sexual partners in the past year. A majority of sexually active males (75.9%, 95% CI 69.9–81.8) and 50.5% (95% CI 42.5–58.6) of females did not know the HIV status of their sexual partners.

Fewer females (76.8%, 95% CI 71.6–82.0) knew where to get a condom than males (91.1%, 95% CI 87.9–94.2). Among those who were sexually active, only 35.0% (95% CI 27.3–42.7) of females and 47.9% (95% CI 40.3–55.5) of males used condoms consistently with their sexual partners in the past year, and 39.0% (95% CI 31.1–47.0) of females and 38.5% (95% CI 30.9–47.1) of males engaged in unsafe sex in the past year. Overall, 5.7% (95% CI 2.7–8.6) of males and 11.8% of females (95% CI 6.4–17.3) who ever had sex had received money, gifts, or favors in exchange for sex in the past.

More females (74.4%, 95% CI 68.4–80.5) had ever been tested for HIV than males (55.2%, 95% CI 48.8–61.6), and among those who were sexually active, females (55.6%, 95% CI 48.1–63.0) were also more likely than males (36.3%, 95% CI 28.3–44.2) to have had an HIV test in the past year.

After controlling for select demographic, behavioural, and biological variables, residing in Central province (AOR 3.58; 95% CI 1.01–12.75); reporting primary education or lower compared to higher level of education (AOR 4.11, 95% CI 2.12–7.96); early sexual debut (AOR1.95, 95% CI 1.03–3.69); having ever received money, gifts or favours in exchange for sex (AOR 3.04, 95% CI 1.11–8.33); having multiple sexual partners in the past year (AOR 2.15, 95% CI 1.05–4.42); and having low self-perceived risk (AOR 1.97, 95% CI 1.05–3.68) were significantly associated with increased odds of unsafe sex (Table 3). Having tested for HIV in the past year (AOR 0.41, 95% CI 0.20–0.85) and knowing where to obtain condoms (AOR 0.26, 95% CI 0.11–0.62) were significantly associated with decreased odds of unsafe sex.

Sexual behaviours of young people aged 20–24 years

Among young people aged 20–24 years who had never been married or cohabited, males (80.5%, 95% CI 76.6–84.3) were more likely to have ever had sex than females (70.7%, 95% CI 65.5–75.8) (Table 2). Males (18.0%, 95% CI 13.9–22.1) were also more likely than females (8.5%, 95% CI4.9–12.1) to report early sexual debut. Among those who had ever had sex, 73.1% (95% CI 69.8–76.3) were sexually active in the past year. Of these, 22.2% (95% CI 17.4–27.1) of males and 6.4% (95% CI 2.7–10.0) of females had two or more

sexual partners in the past year. Less than half knew the HIV status of sexual partners in the past year(43.4%, 95% CI 38.9–47.8); males were less likely to know the HIV status of sexual partners (35.4%, 95% CI 29.9–40.9) than females (61.1%, 95% CI 54.1–68.1). Among those who were sexually active in the past year, only 44.9% (95% CI39.2–50.5) of males and 36.8% (95% CI 30.1–43.4) of females used condoms consistently in the past year. More males(31.9%, 95% CI 26.4–37.5) than females (24.1%, 95% CI18.1–30.1) engaged in unsafe sex in the past year. Overall,9.9% (95% CI 5.3–14.6) of females and 3.0% of males (95% CI 1.3–4.8) had ever received money, gifts, or favours for sex in their lifetime.

Overall, more females (87.8%, 95% CI 83.8–91.8) than males (69.6%, 95% CI 64.7–74.4) had ever been tested for HIV. Similarly, among those who were sexually active in the past year, more females had tested for HIV in the past year (60.3%, 95% CI 53.2–67.5) compared to males (47.0%, 95% CI 41.7–52.4).

In multivariate analysis, having completed primary or lower level of education compared to higher level of education (AOR 1.87, 95% CI 1.12–3.14); having ever received money, gifts or favours in exchange for sex (AOR 2.55, 95% CI 1.03–6.32); and having multiple sexual partners in the past year (AOR 3.10, 95% CI 1.79–5.38) were associated with higher adjusted odds of unsafe sex (Table 4). Residence in Central, Eastern and Nyanza provinces compared to Nairobi (Central AOR 0.25, 95% CI 0.09–0.70; Eastern AOR 0.33, 95% CI 0.13–0.80; Nyanza AOR 0.23, 95% CI 0.08–0.67); being in the highest wealth quintile compared to the poorest (AOR 0.29, 95% CI 0.10–0.84); and having ever been tested for HIV (AOR 0.50, 95% CI 0.28–0.90) or having been tested for HIV in the past year (AOR 0.51, 95% CI 0.30–0.87) were associated with lower adjusted odds of engaging in unsafe sex.

Sexual behaviours in 2007 and 2012

Among males aged 15–19 years, there were significant increases in early sexual debut from 21.7% (95% CI 19.1–24.3) in 2007 to 39.7% (95% CI 33.5–45.8) in 2012 and condom use at first sex from 28.1% (95% CI 23.4–32.7) in 2007 to 42.5% (95% CI 36.4–48.5) in 2012 (Figure 1). Among females aged 15–19, there were significant increases in early sexual debut from 7.4% (95% CI 5.7–9.0) in 2007 to 24.9% (95% CI 19.0–30.9) in 2012. There were no significant differences among males and females aged 15–19 in unsafe sex between 2007 and 2012.

Among males aged 20–24 years, there was a significant increase in condom use at first sex from 31.1% (95% CI26.9–35.2) in 2007 to 47.7% (95% CI 42.3–53.1) in 2012 coupled with a decline in unsafe sex from 36.6% (95% CI 31.3–42.0) in 2007 to 24.1% (95% CI 18.1–30.1) in 2012. Among women aged 20–24 years, there was a significant increase in condom use at first sex from 37.7% (95% CI32.2–43.2) in 2007 to 53.4% (95% CI 47.4–56.9) in 2012 and a significant decline in unsafe sex (from 38.1%, 95% CI29.3–46.8 in 2007 to 24.1%, 95% CI 18.1–30.1, $p < 0.05$).

DISCUSSION

This population-based analysis confirms that young persons in Kenya are engaging in high-risk behaviours that contribute to ongoing HIV transmission in this population. High-risk behaviours include early sexual debut, multiple sexual partnerships, transactional sex, unsafe sex with partners of unknown or sero-discordant HIV status, low HIV testing rates and lack of awareness about sexual partner HIV status. Adolescent girls aged 15–19 years were especially vulnerable, with a notably higher risk of engaging in unsafe sex compared to young men in the same age group and young women aged 20–24 years. In spite of this, young women who were engaging in unsafe sex perceived themselves to be at low risk for HIV. We found that secondary education was associated with safer sexual behaviours, a finding that underscores the importance of supporting young people to remain in school as part of HIV prevention efforts (Kirby, 2002). School attendance has been shown to play an important role in protecting youth from engaging in HIV-related risk behaviours such as early sexual debut and multiple sexual partners (Jukes, Simmons & Bundy, 2008; Hargreaves, Morison & Kim, 2008). Moreover, behavioural interventions delivered to youth in school allow for direct exposure to HIV prevention messages, providing school-based youth with the knowledge and tools to avoid or delay sexual risk behaviour (Coates, Richter & Caceres, 2008; Kirby, 2002).

Although transactional sex was not common, having engaged in transactional sex and being poor were significantly associated with unsafe sex among young persons aged 20–24 years. These findings highlight the economic and social factors that affect behaviour, including decisions on who to have sex with and the ability to negotiate protective behaviour within these partnerships. Innovative approaches to address the structural drivers that are linked with HIV risk among young persons in economically disadvantaged settings should be considered together with behavioural interventions. For example, cash transfers (regular monetary payments to individuals who are eligible) that have been associated with a reduction in high-risk sexual behaviours and improved educational outcomes among young people offer promising options, especially for adolescent girls and young women (Pettifor, McCoy & Padian, 2012; Baird, Garfein & McIntosh, 2012;Handa, Halperin, Pettifor et al, 2014).

Interestingly our results support regional differences in unsafe sex among youth in Kenya. Central province, a region bordering the capital city of Nairobi and with a relatively low burden of HIV infection (NASCOP, 2009), was associated with lower odds of unsafe sex among youth aged 20–24. Nyanza province, the region with the highest HIV prevalence in the country (NASCOP, 2009), and Eastern province also observed a similar protective association with unsafe sex among older youth. Encouragingly, our findings could suggest that HIV prevention interventions in Central, Eastern and Nyanza regions may be achieving some success in reducing unsafe sex among young people aged 20–24. However, starting earlier with age-appropriate messages about safer sex may be needed for children entering adolescence to ensure that they are receiving the right messages to inform their future sexual decision-making.

Between 2007 and 2012, we observed increases in early sexual debut among the younger age group coupled with increases in condom use at first sex in the two age groups and a decline in unsafe sex among women in the older age group. The increase in condom use at first sex among young men and women in the two age groups is consistent with global trends reported for young people in other sub-Saharan African countries (World Health Organization-WPRO, 2015). We found that knowing where to obtain a condom was associated with lower odds of engaging in unsafe sex in the two age groups. Ensuring that condoms are accessible and used consistently remains a key priority of HIV prevention efforts. The low knowledge of sexual partner HIV status in our findings underscores the importance of integrating HIV testing and counselling in interventions targeting sexually active young people. The low HIV testing among young men in 2012 emphasizes the continued need to scale-up HIV testing services that promote self and partner HIV testing among young men.

Our analysis has some limitations. Our definition of unsafe sex relied on self-reported information on partner HIV status which may not have been reported accurately. However, our definition of unsafe sex was more rigorous than previous analyses that defined unsafe sex as sex with a non-marital or non-cohabiting partner (Kenya National Bureau of Statistics & ICF Macro, 2010). Additionally, since risk factors and outcomes were measured simultaneously, we were unable to discern directionality of associations. Temporal trends in sexual behaviours were descriptive and did not adjust for demographic changes in the sample that may have been associated with our outcomes of interest. We note, however, that the KAIS 2007 and KAIS 2012 samples did not differ by age, sex, or regional distribution. Lastly, we excluded married and cohabiting youth aged 15–24 years from this analysis, a sub-group that comprised 28% of youth aged 15–24 years and where substantial transmission is expected to occur.

CONCLUSION

In spite of these limitations, our comprehensive analysis of sexual behaviours of young people provides important information to inform HIV prevention priorities for young people in Kenya and supports the new global focus to prioritize young people as a key population that can reverse the HIV epidemic. Our findings underscore the importance of staying in school, the need to scale-up gender- and age-appropriate HIV prevention interventions that integrate structural interventions with educational messages around safer sex, fewer sexual partnerships, condom access and use and universal awareness of not only one’s own status but also the HIV status of partners. Our findings also show progress in the national HIV response in reducing HIV risk behaviours among young people and particularly among young men. Continued surveillance of behavioural trends among young people in nationally representative surveys is needed to monitor impact as new HIV prevention strategies among youth are rapidly scaled–up over the next five years.

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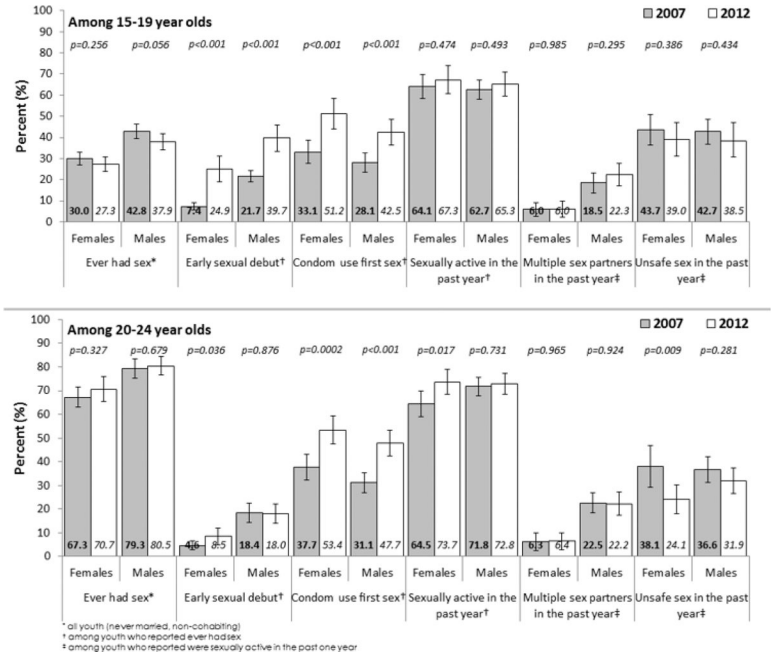

Figure 1.
Sexual behaviour of Kenyan youth by age, sex and year.

Table 1.

Socio-demographic and sexual characteristics of never married, non-cohabiting youth aged 15–19 years by sex, KAIS 2012 (N=2,090)

Variable	N	Total[†] weighted % (95% CI)	n	Male weighted % (95% CI)	n	Female weighted % (95% CI)
Residence						
Rural	1466	71.1 (67.1 – 75.1)	753	72.4 (68.0 – 76.8)	713	69.4 (64.2 – 74.5)
Urban	624	28.9 (24.9 – 32.9)	305	27.6 (23.2 – 32.0)	319	30.6 (25.5 – 35.8)
Region						
Nairobi	204	8.3 (6.6 – 10.1)	95	7.7 (5.8 – 9.6)	109	9.2 (6.7 –11.7)
Central	194	10.3 (8.1 – 12.5)	95	10.0 (7.3 – 12.6)	99	10.8 (8.0 – 13.5)
Coast	229	8.2 (5.8 – 10.5)	107	7.5 (5.3 – 9.6)	122	9.1 (5.9 – 12.3)
Eastern	406	14.0 (11.1 – 16.9)	216	14.5 (10.9 – 18.0)	190	13.4 (10.5 – 16.3)
Nyanza	312	15.8 (12.9 – 18.6)	171	16.6 (12.8 – 20.4)	141	14.7 (11.8 – 17.6)
Rift Valley	416	29.7 (24.8 – 34.6)	213	30.5 (24.8 – 36.2)	203	28.6 (23.0 – 34.2)
Western	329	13.7 (11.0 – 16.4)	161	13.3 (9.7 – 16.8)	168	14.3 (11.6 – 17.0)
Educational level						
No primary	55	1.3 (0.6–1.9)	29	1.0 (0.4 – 1.7)	26	1.6 (0.6–2.7)
Incomplete primary	369	15.0 (12.7 – 17.3)	185	14.7 (11.4 – 18.0)	184	15.4 (12.3 – 18.5)
Complete primary	875	41.7(38.9–44.5)	456	43.3 (39.4 – 47.2)	419	39.5 (35.3 – 43.7)
Secondary+	791	42.0 (38.4 – 45.7)	388	41.0 (36.2 – 45.8)	403	43.4 (38.3 – 48.5)
Wealth index						
Lowest	506	23.4 (19.6 – 27.1)	274	24.8 (20.1 – 29.5)	232	21.4 (17.7–25.1)
Second	531	25.8(22.5 – 29.1)	288	27.6(23.7 – 31.6)	243	23.3 (19.6 – 27.1)
Middle	395	18.6 (16.0 – 21.2)	184	17.0 (14.0 – 19.9)	211	20.7 (17.4 – 24.1)
Fourth	318	15.5 (12.6 – 18.3)	163	15.9 (12.3 – 19.4)	155	15.0 (11.9 – 18.0)
Highest	340	16.8 (13.0 – 20.5)	149	14.7 (11.0 – 18.3)	191	19.5 (14.5 – 24.5)
Circumcised						
Yes	900	85.0 (82.3 – 87.8)	900	85.0 (82.3 – 87.8)	-	-
No	154	15.0 (12.2 – 17.7)	154	15.0 (12.2 – 17.7)	-	-
Religion						

Variable	N	Total† weighted % (95% CI)	n	Male weighted % (95% CI)	n	Female weighted % (95% CI)
Catholic	430	21.4 (18.5–24.4)	216	21.5 (18.0 – 24.9)	214	21.3 (17.6–25.1)
Protestant	1347	68.5 (64.9 – 72.1)	659	67.5 (63.3 – 71.7)	688	69.8 (64.9 – 74.7)
Muslim	234	6.6 (4.2 – 8.9)	126	6.1 (3.9 – 8.3)	108	7.2 (2.9 – 11.4)
None	47	2.5 (1.3 – 3.7)	35	3.6 (1.7–5.6)	12	1.0 (0.3 – 1.7)
Other	32	1.0 (0.4 – 1.7)	22	1.3 (0.3 – 2.2)	10	0.7 (0.2 – 1.3)
Ever had sex						
No	1451	66.7 (63.9 – 69.4)	679	62.1 (58.4 – 65.8)	772	72.7 (69.3 – 76.2)
Yes	635	33.3 (30.6 – 36.1)	377	37.9 (34.2 – 41.6)	258	27.3 (23.8 – 30.7)
Early sexual debut						
No	417	65.5 (60.8 – 70.2)	228	60.3 (54.2 – 66.5)	189	75.1 (69.1 – 81.0)
Yes	209	34.5 (29.8 – 39.2)	144	39.7 (33.5 – 45.8)	65	24.9 (19.0 – 30.9)
*Ever tested for HIV**						
No	226	38.0 (33.3 – 42.8)	161	44.8 (38.4 – 51.2)	65	25.6(19.5 – 31.6)
Yes	409	62.0 (57.2 – 66.7)	216	55.2 (48.8 – 61.6)	193	74.4 (68.4 – 80.5)
*Knows where to get a condom**						
No	99	13.9 (11.2 – 16.7)	34	8.9 (5.8 – 12.1)	65	23.2 (18.0 – 28.4)
Yes	536	86.1 (83.3 – 88.8)	343	91.1 (87.9 – 94.2)	193	76.8 (71.6 – 82.0)
*Used a condom at first sex**						
No	333	54.5(49.9–59.1)	205	57.5 (51.4 – 63.7)	128	48.8(41.7–56.0)
Yes	302	45.5(40.9–50.1)	172	42.5 (36.4 – 48.5)	130	51.2 (44.0 – 58.3)
*Ever received money, gifts or favours for sex**						
No	390	92.1 (89.5 – 94.8)	234	94.3 (91.4 – 97.3)	156	88.2 (82.7 – 93.6)
Yes	33	7.9 (5.2 – 10.5)	15	5.7 (2.7 – 8.6)	18	11.8 (6.4 – 17.3)
*Sexually active in the past year**						
No	212	34.0 (29.3 – 38.7)	128	34.7 (28.9 – 40.5)	84	32.7 (26.1 – 39.3)
Yes	423	66.0 (61.3 – 70.7)	249	65.3 (59.5 – 71.1)	174	67.3 (60.7 – 73.9)
*Tested for HIV in the last year***						
No	231	56.8 (51.1 – 62.5)	156	63.7 (55.8 – 71.7)	75	44.4 (37.0 – 51.9)

Variable	N	Total† weighted % (95% CI)	n	Male weighted % (95% CI)	n	Female weighted % (95% CI)
Yes	192	43.2 (37.5 – 48.9)	93	36.3 (28.3 – 44.2)	99	55.6 (48.1 – 63.0)
*Had multiple (2+) sex partners in past year***						
No	358	83.6 (79.7 – 87.4)	194	77.7 (72.2 – 83.1)	164	94.0 (90.2 – 97.8)
Yes	62	16.4 (12.6 – 20.3)	52	22.3 (16.9 – 27.8)	10	6.0 (2.2 – 9.9)
*Knew HIV status of sexual partners in the past year***						
No	274	66.7 (61.9 – 71.6)	187	75.9 (69.9 – 81.8)	87	50.5 (42.5 – 58.6)
Yes	146	33.3 (28.4 – 38.1)	59	24.1 (18.2 – 30.1)	87	49.5(41.4–57.5)
*Consistent condom use in past year***						
No	237	56.7 (51.2 – 62.3)	125	52.1 (44.5 – 59.7)	112	65.0 (57.3 – 72.7)
Yes	183	43.3 (37.7–48.8)	121	47.9 (40.3 – 55.5)	62	35.0 (27.3 – 42.7)
*Had unsafe sex in the past year***						
No	264	61.3(56.0–66.6)	156	61.5 (54.0 – 69.0)	108	61.0 (53.0 – 69.0)
Yes	159	38.7 (33.4 – 44.0)	93	38.5 (30.9 – 47.1)	66	39.0(31.1–47.0)
*Use condom with last sexual partner in past year***						
No	228	54.7 (49.0 – 60.5)	119	49.7 (42.1 – 57.3)	109	63.8 (56.0 – 71.5)
Yes	191	45.3 (39.5 – 51.0)	127	50.3 (42.7 – 57.9)	64	36.2 (28.5 – 44.0)
Illicit drug use in past year						
No	1922	91.2 (89.2 – 93.2)	916	86.4 (83.0 – 89.7)	1006	97.6 (96.5 – 98.7)
Yes	168	8.8 (6.8 – 10.8)	142	13.6 (10.3 – 17.0)	26	2.4 (1.3 – 3.5)
*Self–perception of HIV risk****						
No risk	41	34.8 (25.0 – 44.6)	26	38.8 (26.2 – 51.3)	15	26.9 (13.8 – 40.1)
Low risk	49	36.9 (26.1 – 47.7)	30	34.4 (21.8 – 47.1)	19	41.9 (27.2 – 56.6)
Moderate risk	22	15.6 (9.1 – 22.2)	10	12.7(5.1 – 20.3)	12	21.5 (9.8 – 33.2)
High risk	18	12.6 (6.5 – 18.7)	13	14.1 (6.5 – 21.7)	5	9.7 (1.3 – 18.0)

*Among youth who had ever had sex.

**Among youth who were sexually active in the past year.

***Among sexually active youth who reported unsafe sex in the past year.

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† Due to missing responses, totals vary between variables.

Table 2.

Socio-demographic and sexual characteristics of never married, non-cohabiting youth aged 20–24 years by sex, KAIS 2012 (N=1079)

Variable	N	Total† weighted % (95% CI)	n	Male weighted % (95% CI)	n	Female weighted % (95% CI)
Residence						
Rural	564	53.3 (48.5 – 58.1)	360	55.3 (49.7–61.0)	204	49.2 (42.6 – 55.8)
Urban	515	46.7 (41.9 – 51.5)	288	44.7 (39.0 – 50.3)	227	50.8 (44.2 – 57.4)
Region						
Nairobi	219	16.7 (13.6 – 19.8)	110	14.7 (11.4 – 18.0)	109	20.6 (15.7 – 25.5)
Central	98	10.2 (7.7 – 12.7)	60	10.3 (7.4 – 13.2)	38	10.0 (6.0 – 13.9)
Coast	125	9.5 (7.0 – 11.9)	84	10.3 (7.4 – 13.1)	41	8.0(4.7 –11.3)
Eastern	206	16.1 (13.0 – 19.3)	143	17.1 (13.2 –21.0)	63	14.2 (10.4 – 18.0)
Nyanza	116	10.9 (8.2 – 13.5)	64	10.3 (7.0 – 13.6)	52	12.0 (8.5 – 15.6)
Rift Valley	209	28.1 (23.0 – 33.1)	129	29.6 (23.6 – 35.7)	80	24.9 (18.0 –31.8)
Western	106	8.6 (6.4 – 10.8)	58	7.8 (5.2 – 10.4)	48	10.3 (6.8 – 13.9)
Educational level						
No primary	33	1.4 (0.5 –2.3)	23	1.0 (0.2 – 1.9)	10	2.1 (0.6 – 3.6)
Incomplete primary	52	3.8 (2.5 – 5.1)	30	3.1 (1.6 – 4.6)	22	5.3 (2.9 – 7.7)
Complete primary	267	24.3 (21.0 – 27.6)	176	25.6(21.6 – 29.7)	91	21.6 (16.8–26.4)
Secondary+	727	70.5 (66.8 – 74.1)	419	70.2 (65.8 – 74.7)	308	71.0 (65.8 – 76.1)
Wealth index						
Lowest	182	15.8 (12.1 – 19.5)	133	18.3 (13.4 – 23.2)	49	10.8 (7.4 – 14.3)
Second	154	15.1 (11.9 – 18.3)	91	15.3 (11.3 – 19.3)	63	14.7 (10.7 – 18.7)
Middle	182	16.5 (13.4 – 19.6)	114	17.3 (13.3 – 21.3)	68	14.9 (10.9 – 19.0)
Fourth	251	23.3 (19.2 – 27.4)	155	23.1 (18.6 – 27.7)	96	23.6 (17.3 – 29.9)
Highest	310	29.3 (24.6 – 34.1)	155	26.0(20.6 – 31.3)	155	36.0 (29.6 – 42.4)
Circumcised						
Yes	602	93.2 (90.7 – 95.6)	602	93.2 (90.7 – 95.6)	-	-
No	43	6.8 (4.4 – 9.3)	43	6.8 (4.4 – 9.3)	-	-
Religion						

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Variable	N	Total† weighted % (95% CI)	n	Male weighted % (95% CI)	n	Female weighted % (95% CI)
Catholic	281	26.7 (23.0 – 30.4)	155	24.5 (20.3 – 28.6)	126	31.1 (24.7 – 37.5)
Protestant	655	63.8 (59.9 – 67.7)	379	64.1 (59.7 – 68.6)	276	63.2 (56.8 – 69.6)
Muslim	98	5.5 (3.5 – 7.6)	77	6.3 (4.0 – 8.5)	21	4.1 (1.6 – 6.6)
None	33	3.4 (1.9 – 4.8)	28	4.6 (2.6 – 6.7)	5	0.9 (0.0 – 1.7)
Other	12	0.6 (0.1 – 1.1)	9	0.5 (0.0 – 1.1)	3	0.7 (0.0 – 1.5)
Ever had sex						
No	269	22.8 (19.8 – 25.8)	141	19.5 (15.7 – 23.4)	128	29.3 (24.2 – 34.5)
Yes	805	77.2 (74.2 – 80.2)	505	80.5 (76.6 – 84.3)	300	70.7 (65.5 – 75.8)
Early sexual debut						
No	675	84.9 (81.8 – 88.1)	409	82.0 (77.9 – 86.1)	266	91.5 (87.9 – 95.1)
Yes	108	15.1 (11.9 – 18.2)	84	18.0(13.9 – 22.1)	24	8.5 (4.9 – 12.1)
*Ever tested for HIV**						
No	193	24.8 (21.0 – 28.6)	154	30.4 (25.6 – 35.3)	39	12.2 (8.2 – 16.2)
Yes	610	75.2 (71.4 – 79.0)	349	69.6 (64.7 – 74.4)	261	87.8 (83.8 – 91.8)
*Knows where to get a condom**						
No	51	4.7 (3.3 – 6.2)	21	3.0 (1.5 – 4.4)	30	8.7 (5.2 – 12.2)
Yes	754	95.3 (93.8 – 96.7)	484	97.0 (95.6 – 98.5)	270	91.3 (87.8 – 94.8)
*Used a condom at first sex**						
No	395	50.5 (46.5 – 54.6)	255	52.3 (46.9 – 57.7)	140	46.6 (40.5 – 52.6)
Yes	410	49.5 (45.4 – 53.5)	250	47.7 (42.3 – 53.1)	160	53.4 (47.4 – 59.5)
*Ever received money, gifts or favours for sex**						
No	549	94.8 (92.9 – 96.7)	352	97.0 (95.2 – 98.7)	197	90.1 (85.4 – 94.7)
Yes	33	5.2 (3.3 – 7.1)	14	3.0 (1.3 – 4.8)	19	9.9 (5.3 – 14.6)
*Sexually active in the past year**						
No	223	26.9 (23.7 – 30.2)	139	27.2 (22.8 – 31.6)	84	26.3 (21.1 – 31.5)
Yes	582	73.1 (69.8 – 76.3)	366	72.8 (68.4 – 77.2)	216	73.7 (68.6 – 78.8)
*Tested for HIV in the last year***						
No	278	48.8 (44.6 – 53.1)	194	53.0 (47.6 – 58.3)	84	39.7 (32.5 – 46.8)

Variable	N	Total† weighted % (95% CI)	n	Male weighted % (95% CI)	n	Female weighted % (95% CI)
Yes	304	51.2 (46.9 – 55.4)	172	47.0(41.7 – 52.4)	132	60.3 (53.2 – 67.5)
*Had multiple (2+) sex partners in past year***						
No	474	82.7 (79.2 – 86.2)	274	77.8 (72.9 – 82.6)	200	93.6 (90.0 – 97.3)
Yes	98	17.3 (13.8 – 20.8)	85	22.2 (17.4 – 27.1)	13	6.4 (2.7 – 10.0)
*Knew HIV status of sexual partners in the past year***						
No	317	56.6 (52.2 – 61.1)	233	64.6 (59.1 – 70.1)	84	38.9(31.9 – 45.9)
Yes	255	43.4 (38.9 – 47.8)	126	35.4 (29.9 – 40.9)	129	61.1 (54.1 – 68.1)
*Consistent condom use in past year***						
No	338	57.6 (53.4 – 61.9)	159	44.9 (39.2 – 50.5)	75	36.8 (30.1 – 43.4)
Yes	234	42.4 (38.1 – 46.6)	159	44.9 (39.2 – 50.5)	75	36.8 (30.1 – 43.4)
*Had unsafe sex in the past year***						
No	412	70.5 (66.4 – 74.7)	246	68.1 (62.5 – 73.6)	166	75.9 (69.9 – 81.9)
Yes	170	29.5 (25.3 – 33.6)	120	31.9 (26.4 – 37.5)	50	24.1 (18.1 – 30.1)
*Use condom with last sexual partner in past year***						
No	299	50.9 (46.6 – 55.2)	167	46.0 (40.3 – 51.6)	132	61.9 (55.1 – 68.8)
Yes	264	49.1 (44.8 – 53.4)	188	54.0 (48.4 – 59.7)	76	38.1 (31.2 – 44.9)
Illicit drug use in past year						
No	835	76.2 (73.0 – 79.4)	427	66.9 (62.5 – 71.2)	408	94.6 (92.2 – 97.0)
Yes	244	23.8 (20.6 – 27.0)	221	33.1 (28.8 – 37.5)	23	5.4 (3.0 – 7.8)
*Self–perception of HIV risk****						
No risk	40	24.9 (16.3 – 33.5)	28	23.1 (12.7 – 33.5)	12	30.4 (16.0 – 44.8)
Low risk	75	48.8(39.7 – 57.9)	51	47.9 (36.9 – 58.9)	24	51.5 (35.5 – 67.5)
Moderate risk	26	16.0 (9.6 – 22.3)	20	16.9 (9.4 – 24.4)	6	13.1 (3.0 – 23.2)
High risk	15	10.4 (5.1 – 15.6)	13	12.1 (5.5 – 18.7)	2	5.1 (0.0 – 11.9)

*Among youth who had ever had sex.

**Among youth who were sexually active in the past year.

***Among sexually active youth who reported unsafe sex in the past year.

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† Due to missing responses, totals vary between variables.

Table 3.

Factors associated with unsafe sex among never married, non-cohabiting youth aged 15–19 years, KAIS 2012 (N=423)

Variable	Unweighted N (total[†])	Unweighted unsafe sex n	Unadjusted OR (95% CI)	p-value	AOR (95% CI)	p-value
Sex						
Male	249	93	ref	-	ref	-
Female	174	66	1.02 (0.63 – 1.66)	0.934	1.19 (0.61 – 2.32)	0.619
Residence						
Rural	122	43	ref	-	ref	-
Urban	301	116	0.97 (0.62 – 1.52)	0.889	0.67 (0.35 – 1.28)	0.225
Region						
Nairobi [*]	44	14	ref	-	ref	-
Central	23	11	3.10 (1.08 – 8.86)	0.281	**3.58 (1.01 – 12.75)**	0.049
Coast [*]	47	18	1.30 (0.59 – 2.84)	-	0.68 (0.20 – 2.28)	0.529
Eastern	54	17	1.00 (0.43 – 2.31)	-	0.34 (0.07 – 1.55)	0.163
Nyanza	103	36	1.30 (0.64 – 2.62)	-	1.25 (0.39 – 3.98)	0.705
Rift Valley	85	35	1.76 (0.84 – 3.68)	-	1.18(0.37 – 3.78)	0.777
Western	67	28	1.85 (0.78 – 4.40)	-	1.65(0.49 – 5.58)	0.422
Educational level						
Primary or lower	249	110	2.30 (1.52 – 3.49)	<.001	**4.11 (2.12 – 7.96)**	**<.001**
Secondary or higher	174	49	ref	-	ref	-
Wealth index						
Poorest	81	37	ref	-	-	-
Second	129	50	0.94 (0.45 – 1.97)	0.535	-	-
Third	85	30	0.72 (0.34 – 1.53)	-	-	-
Fourth	67	22	0.65 (0.31 – 1.38)	-	-	-
Richest	61	20	0.62 (0.28 – 1.39)	-	-	-
Early sexual debut						
No	313	101	ref	-	ref	-
Yes	106	55	2.27 (1.36 – 3.78)	0.002	**1.95 (1.03 – 3.69)**	**0.04**

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Variable	Unweighted N (total†)	Unweighted unsafe sex n	Unadjusted OR (95% CI)	p-value	AOR (95% CI)	p-value
*Ever tested for HIV**						
No	148	73	ref	-	ref	-
Yes	275	86	0.43 (0.28 – 0.65)	<.001	0.71 (0.35 – 1.42)	0.329
Tested for HIV in the last year						
No	231	108	ref	-	ref	-
Yes	192	51	0.36 (0.24 – 0.54)	<.001	**0.41 (0.20 – 0.85)**	**0.016**
Knows where to get a condom						
No	54	31	ref	-	ref	-
Yes	369	128	0.40 (0.20 – 0.78)	0.007	**0.26 (0.11 – 0.62)**	**0.002**
*Ever received money, gifts or favours for sex**						
No	390	142	ref	-	ref	-
Yes*	33	17	1.63 (0.76 – 3.53)	0.213	**3.04 (1.11 – 8.33)**	**0.03**
*Had multiple (2+) sex partners in past year***						
No	358	129	ref	-	ref	-
Yes	62	30	1.75 (0.96 – 3.19)	0.066	**2.15 (1.05 – 4.42)**	**0.037**
Illicit drug use in past year						
No	350	129	ref	-	ref	-
Yes	73	30	1.50 (0.78 – 2.90)	0.226	1.99 (0.89 – 4.44)	0.093
Self–perception of HIV risk						
No risk	140	41	ref	-	ref	-
Low risk	144	49	1.29 (0.72 – 2.30)	0.057	**1.97 (1.05 – 3.68)**	**0.034**
Moderate/high risk	88	40	1.93 (1.13 – 3.32)	-	1.90 (0.98 – 3.67)	0.056

OR: Odds Ratio; AOR: Adjusted Odds Ratio; CI: Confidence Interval

*Sample size less than 50 observations; therefore estimate may be unreliable.

†Due to missing responses, totals vary between variables. Bolded estimates reflect statistically significant associations.

Table 4.

Factors associated with unsafe sex among never married, non-cohabiting youth aged 20–24 years, KAIS 2012 (N=582)

Variable	Unweighted N	Unweighted unsafe sex n	Unadjusted OR (95% CI)	p-value	AOR (95% CI)	p-value
Sex						
Male	216	120	ref	-	ref	-
Female	366	50	0.68 (0.44 – 1.04)	0.076	0.95 (0.54 – 1.67)	0.851
Residence						
Rural	311	86	ref	-	ref	-
Urban	271	84	1.21 (0.81 – 1.81)	0.344	0.96 (0.50 – 1.87)	0.915
Region						
Nairobi	135	46	ref	-	ref	-
Central *	41	8	0.38 (0.16 – 0.90)	0.013	**0.25 (0.09 – 0.70)**	**0.008**
Coast	77	18	0.56 (0.27 – 1.17)	-	0.39 (0.13 – 1.17)	0.093
Eastern	87	24	0.69 (0.35 – 1.33)	-	**0.33 (0.13 – 0.80)**	**0.014**
Nyanza	69	11	0.34 (0.14 – 0.83)	-	0.23 (0.08 – 0.67)	0.007
Rift Valley	112	36	0.75 (0.41 – 1.36)	-	0.52 (0.24 – 1.13)	0.098
Western	61	27	1.31 (0.73 – 2.37)	-	0.48 (0.18 – 1.28)	0.142
Educational level						
Primary or lower	173	74	2.23 (1.45 – 3.44)	<.001	**1.87 (1.12 – 3.14)**	**0.017**
Secondary or higher	409	96	ref	-	ref	-
Wealth index						
Poorest	70	30	ref	-	ref	-
Second	78	22	0.52 (0.23 – 1.17)	0.036	0.46 (0.17 – 1.22)	0.117
Third	99	30	0.58 (0.28 – 1.20)	-	0.51 (0.20 – 1.31)	0.161
Fourth	150	44	0.57 (0.31 – 1.06)	-	0.53 (0.21 – 1.36)	0.187
Richest	185	44	0.34 (0.17 – 0.66)	-	**0.29 (0.10 – 0.84)**	**0.023**
Early sexual debut						
No	495	141	ref	-	-	-
Yes	74	26	1.22 (0.66 – 2.26)	0.518	-	-

Variable	Unweighted N	Unweighted unsafe sex n	Unadjusted OR (95% CI)	p-value	AOR (95% CI)	p-value
Ever tested for HIV[*]						
No	128	68	ref	-	ref	-
Yes	452	102	0.28 (0.18 – 0.43)	<.001	**0.50 (0.28 – 0.90)**	**0.021**
Tested for HIV in the last year						
No	278	112	ref	-	ref	-
Yes	304	58	0.34 (0.22 – 0.51)	<.001	**0.51 (0.30 – 0.87)**	**0.014**
Knows where to get a condom						
No	28	15	ref	-	ref	-
Yes	554	155	0.40 (0.17 – 0.94)	0.035	0.41 (0.13 – 1.31)	0.132
Ever received money, gifts or favours for sex[*]						
No	549	157	ref	-	ref	-
Yes	33	13	1.56 (0.76 – 3.22)	0.228	**2.55 (1.03 – 6.32)**	**0.043**
*Had multiple (2+) sex partners in past year***						
No	474	123	ref	-	ref	-
Yes	98	47	2.43 (1.49 – 3.95)	<.001	**3.10 (1.79 – 5.38)**	**<.001**
HIllicit drug use in past year						
No	428	126	ref	-	-	-
Yes	154	44	0.86 (0.54 – 1.38)	0.537	-	-
Self-perception of HIV risk						
No risk	154	40	ref	-	-	-
Low risk	273	75	1.11 (0.64 – 1.93)	0.398	-	-
Moderate/high risk	117	41	1.52 (0.78 – 2.97)	-	-	-

OR: Odds Ratio; AOR: Adjusted Odds Ratio; CI: Confidence Interval

[*]Sample size less than 50 observations; therefore estimate may be unreliable.

[†]Due to missing responses, totals vary between variables. Bolded estimates reflect statistically significant associations.