Vol. 2(3) pp. 010-016, October 2016
Available online http://transconpublishers.org/icjmms

Full Length Research Paper

Impact of an Integrated HIV/STI Prevention Project in Reducing Behavioral Risks for Out-of-school, 15-24-year-old girls in Mukuru Slums, Nairobi

Julius N. Nguku[1]*, Elizabeth W. Mwaniki[2] and Fiona Mbai[3]

[1]Technical University of Kenya, Department of Community and Public Health, School of Health Sciences and Technology, P.O. Box 52428-00200, Nairobi Kenya.
[2]Technical University of Kenya, Department of Community and Public Health, School of Health Sciences and Technology P.O. Box 52428-00200, Nairobi Kenya.
[3]Technical University of Kenya, Directorate of Research and Knowledge Exchange P.O. Box 52428-00200, Nairobi Kenya.

Accepted 19 October, 2016

Despite the progress in the overall global HIV/AIDS response, AIDS is still the leading cause of deathamong Adolescent Girls and Young Women (AGYW) aged 15-24 years in Kenya, where 468 new HIV infections occur among them every week. AGWY residing in informal urban settings are especially vulnerable. This paper looked at the self-reported changes in HIV/STI protective behavior by AGYW residing in Mukuru Slums, Nairobi, participating in an integrated project named Bold Idea for Girls (BIG). In November 2013, 546AGYW were enrolled into the project. Behavioral data was collected and reported as proportions at baseline and end-term levels. A regression model was used to determine any differences in behavior between the two levels. The proportion of sexually active girls who had tested for HIV in the last three months increased from 23% to 57%, condom use during sex from 15% to 77% and those with multiple sexual partners reduced from 17% to 6%. These results were all significant at $p<0.05$ even after controlling for age. The results support the argument for integrating gender, life-skills; and economic empowerment aspects into HIV prevention programs targeting AGYW in resource-poor settings in order to increase protective behavior.

Keywords: HIV, young women, integrated program, behavior change.

*Corresponding Author E-mail: njathi.wambui@gmail.com; Tel: +254 722 358068

List of Abbreviations

AGWY, Adolescent Girls and Young Women; BIG, Bold Idea for Girls; EBI, Evidence-based Behavioral Interventions; KAIS, Kenya AIDS Indicator Survey; KDHS, Kenya Demographic Health Survey; NACC, National AIDS Control Council

INTRODUCTION

The recent progress in the overall global HIV/AIDS response notwithstanding, AIDS is still the leading cause of death among Adolescent Girls and Young Women (AGYW) aged 15-24 in Eastern and Southern Africa with as many as 7,000 new infections a week, 468 of them being in Kenya (Nabukalu et al.,2013).The greater susceptibility of AGYW to HIV infection compared to men has been well documented (Nabukalu et al., 2013; KAIS, 2012; Kabiru et al.,2011; NACC,2015; Dellar et al.,2015).In sub-Saharan Africa, 12-13 women are infected by HIV for every ten men, and the average rate of infection for teenage girls in some countries is five times higher than that for teenage boys.Compared to males of the same age-group, females aged 15-19 years are also less likely to access services offered by health programsand have less knowledge on HIV and AIDS (KDHS, 2014). Despite the large and immediate HIV prevention need of adolescent girls and young women, there is a dearth of evidence-based interventions to reduce their risk (Dellar et al., 2015).

In Kenya, the HIV incidence is estimated to be 0.5% (95% C.I 0.2 – 0.9), representing approximately 106,000 persons (95% C.I 30,000 – 180,000) who were infected with HIV in 2012. Twenty-one percent of all new infections areamong women aged 15-24 years (KAIS,2012). The figure 1, below, compares the number and proportion of new infections among the youth aged 15-19 years and those aged 20-24 years in Kenya during the year 2012. Most of these infections occur through unprotected heterosexual interactions(NACC, 2015; Dellar et al.,2015).

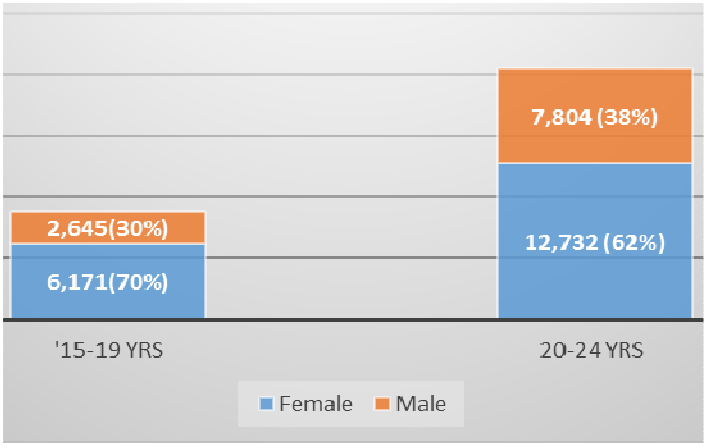

Figure 1. Number of new HIV infections among the youth in Kenya by age and sex in 2012

The Figure 1 compares the number and proportion of new HIV infections among 15-19 year- old and 20-24 year-old youth during the year 2012 by sex in Kenya: Adapted from KAIS (2012)

There is a dramatic difference in HIV prevalence between 15-19year-old females (1.1%) and 20-24 year-old females (4.6%)(KAIS, 2012) which suggests that many young women are infected during adolescence, showing the need for the emphasis on this sub-population. Similar age-sex disparity in HIV acquisition was observed in a bio-behavioral cross-sectional survey among high school students in rural KwaZulu-Natal South Africa (Karim et al., 2014) as shown in the figure 2, below.

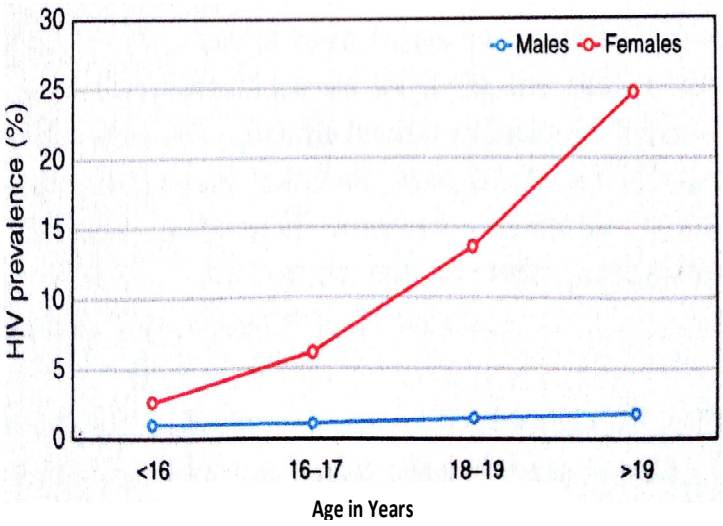

Figure 2. Age-sex disparity in HIV acquisition

Figure 2 shows age-sex disparity in HIV acquisition among high school students aged between 16 to 19 years in rural KwaZulu-Natal. Adapted from Abdool Karim et al., (2014)

The higher vulnerability of the adolescent girls and young women is caused by anatomical, social and economic reasons. STIs are transmitted with greater efficiency from males to females because the female genital tract provides a larger surface area for infection. The exocervix of a young woman before puberty is lined with only a single layer columnar epithelial cells, which pre-disposes young women to HIV and chlamydial and gonorrheal pathogens infection (Karim et al., 2010).

Socially, inequalities between men and women reinforced by gender roles typically leave women especially vulnerable to HIV infection and its impacts. Power inequity and intimate partner violence increase risk of HIV infection in young women (Higgins et al., 2010; Jewkes and Morrell, 2010). There is need to empower especially the young, poor and least educated women to make decisions on health seeking behaviors (Mbonye et al., 2010). Peer-mediated education programs for the control of HIV infection and other

sexually transmitted diseases can lead to increased condom use andchange in community attitudes and norms (Maticka-Tyndale and Barnett, 2010).Further, in young women, it has been established that one driver of the high HIV incidences is transactional sex (Jewkes et al., 2012).Transactional sex occurs where a woman has a heterosexual relationship (or act) motivated by the male partner providing cash or in-kind to her (Ott et al., 2011). The transactional relationshipsusually occur between an older male partners(commonly referred to as “sponsors” among Mukuru girls),and younger females, augmenting the HIV risk tothe females who areless likely to negotiate condom use given the gender-power dynamics as observed by Dellar (2015).

There are significant differences in HIV prevalence between slum residents and the people living in other urban and rural areas and HIV prevention efforts and treatment programs should target the urban poor and acknowledge that city dwellers are not a homogeneous group (Madise et al.,2012; Kabiru et al.,2010). Creating livelihood opportunities for young women in urban slums has been found to induce a strong motivation to preserve their health and reduce reliance on sex work thus reducing sexual risks (Jewkes et al., 2012; UNICEF, 2011; Seelay et al., 2012).

There is an unprecedented opportunity to develop “prevention packages” that combine various evidence-based strategies, tailored to the needs of diverse subgroups and targeted to achieve reduction in population-level HIV transmission (Kurth et al.,2011).

This study aimed to establish the impact of an integrated,one and half year project program referred to as Bold Idea for Girls (BIG). The project was funded by Grand Challenges Canada and it began in November 2013. It comprised of HIV Evidence-informed Behavioral Interventions (EBIs), gender and life-skills, which were provided through a peer-mediated approach in small groups called “sister walks”; and vocational and entrepreneurial skills to AGYW aged 15-24 years in Mukuru Slums, Nairobi. In this study, 549 AGWY were identified and 522of them filled interviewer-assisted Knowledge, Attitude, Perceptions, Behavior (KAPB) standard questionnaire for baseline information and 165 of them participated in responding to the questionnaire at end-term.

METHODS

Enrollment

In November 2013, 546, 15-24 year old girls were identified from four main clusters/villages of the Mukuru Slums, Nairobi, through stratified probability proportional to size sampling methodologyand enrolled into the program.The four clusters were: Mukuru Kwa Reuben, Mukurukwa Njenga, Lunga-lunga and Kayaba. For inclusion into the study the participant fulfilled the following criteria:adolescent girls and young women aged between 15-24 years old; reside in one of the 4 main clusters of the noted Mukuru villages; out-of-school; and not currently in an HIV program.

Study design and procedures

A baseline measurement was conducted using a standard Knowledge, Attitude, Perceptions and Behaviour (KAPB) survey tool which was developed by the Principle Investigator and administered by fourtrained research assistants. The questionnaire had both the English and Kiswahili versions and interviews were conducted in both languages as needed. The questionnaire was in five parts covering: Demographic information, Knowledge, Attitude towards HIV and AIDS, Perceptions on power in sexual relationships; and Risk Behaviours. The research assistants’training emphasized informed consent, confidentiality and non-judgemental approach. The participants aged over 18 years gave their own informed consent to participate in the study. However, parental/guardian consent was obtained for those below 18 years in addition to their own consent.Ethical approval for the research was given by the Kenyatta National Hospital/University of Nairobi Ethics and Research Committee (approval number P615/12/2013).

Baseline results were correlated with end-term measurements through data collected using the same tool in April 2015. One hundred and sixty-five (165) girls participated in the end-term assessment. The study design was time-series quasi-experimental.

At end-term, the project staff also conducted a Sexually Transmitted Infections (STI) campaign whereby 79 girls who were participating in the BIG project; and 65girls from Mukuru Slums who were not part of the BIG or any other HIV/STI project—voluntarily had STI screening. Those who tested positive to any STI were treated. Comparing BIG and non-BIG girls with respect to STI prevalence gave an idea about consistent and correct condom use without relying on self-reported information.

Data management and Statistical analysis

For both levels, the questionnaire data were coded and double entered using Epi-Info 2002 (*CDC, Atlanta, Georgia, USA*) and analysis conducted using IBM SPSS version 20 (*Statistics,IBM SPSS. "Version 20." Armonk, NY: International Business Machines Corp, 2011).*Socio-demographic characteristics of the participants at baseline and end-term levels were reported as proportions and compared.

The participants who were not sexually active were excluded, leaving 284 girls at baseline and 103 at end-term. The independent variables were: age, marital status, highest level of education attained, income status,

Table 1. Demographic characteristics of the participants

Socio-demographic Characteristics	Baseline (N=522)		End term (N=165)	
	N	%	n	%
Age				
15-17	118	23	27	16
18-20	227	43	73	44
21-22	83	16	33	20
23-24	95	18	32	20
Village				
Kayaba	27	6	6	4
Kwa Njenga	165	32	57	34
Kwa Reuben	188	35	56	34
LungaLunga	143	27	46	28
Level of Education				
Incomplete primary	21	6	8	7
Complete primary	112	32	55	33
Incomplete Secondary	69	20	32	20
Complete secondary	149	42	67	40
Marital Status				
Single/divorced/separated	407	78	138	82
Married/cohabiting with man	115	22	27	18
Income Status				
Have Income	73	14	82	50
Do not have income	449	86	83	79

village of residence;and whether the participant had children. The outcome variables were: Knowledge about HIV prevention, perception aboutpower in sexual relationships, Attitude, sexual risk behaviours and health-seeking behavior.

Knowledge about HIV/STI prevention was measured by the variable *"I know how to practise safe sex".*To determine sexual risk behaviours, the variables *correct and consistent condom use* and *having more than one sexual partner*s were used. Health- seeking behavior was measured using the variable *testing for HIV in the last three months*. The measure*"It is impossible for a girl to make a man to use a condom during sex"*was used to determine the perception about power in sexual relationships. Attitude was measured by asking about HIV-testing history and whether the participant would go for counseling if she tested positive to HIV.

Bivariate analyses were conducted to compare outcome scores between baseline and end-term levels. Odds ratios and p-values were calculated to determine differences, if any, between the two levels.To control for age, sexual behaviours by participants in the age ranges 15-20 and 21-24 years were compared separately.To establish the correlation between knowledge, correct and consistent condom use, "power"and income of the girls, Pearson's correlation coefficients were determined at end-term.

RESULTS

Demographic Characteristics of the Participants

Out of the 546 girls enrolled, 522 (96%) accepted to participate in the study and responded to the questionnaire at baseline. The table 1, above, shows the age, village of residence, highest level of education attained, marital status and income status of the participants at baseline and end-term levels.

Knowledge, perception of "power" in sexual relationships, Attitude; and health-seeking and sexual behaviours between baseline and end-term levels

Table 2, below, shows the number and proportions for knowledge about HIV and AIDS, "power" in sexual relationships, attitude, condom use, tested for HIV in the last months; and having more than one sexual partners at baseline and endterm levels. The table also details the

Table 2. Knowledge, "power" in sexual relationship, attitude; and sexual behaviours between baseline and end-term levels

	Sexually active girls at baseline (N=284)			Sexually active girls at end-term (N=103)			Unadjusted OR (95% C.I)	p-value
	n	n/N	%	n	n/N	%		
Have knowledge about HIV/STI prevention	140	140/284	49.4	84	84/103	82	4.55 (2.62-7.87)	P<0.0001*
'power" in sexual relationship	162	162/284	57	84	84/103	82	3.329 (1.92-5.77)	P<0.0001*
Correct Attitude wrt HIV/AIDS	179	179/284	63	86	86/103	83	2.967 (1.673-5.265)	P=0.0002*
Consistent, Correct Condom Use	44	44/284	15	79	79/103	77	17.954 (10.27-31.388)	p<0.0001*
Tested in the last 3 months	66	66/284	23	59	59/103	57	4.429 (2.747-7.142)	p<0.0001*
More than one sexual partners	49	49/284	17	6	6/103	6	0.297 (0.123-0.715)	p=0.007*

OR=Odds Ratio
CI=Confidence Interval
* significant (p=0.05) difference between the baseline and end-term results

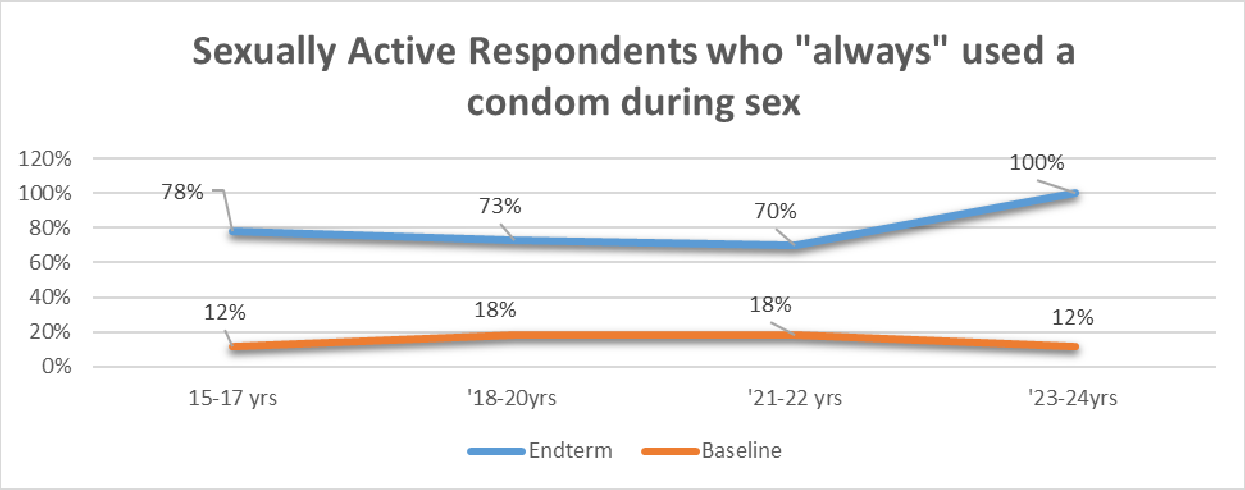

Figure 3. Comparing sexually active participants who "always" used a condom during sex

The figure 3, compares the proportion of sexually active participants who answered "Älways" to the question *"How often do you practise safe sex?*" at baseline and at end-term levels by age-ranges.

unadjusted odds ratios and p-values between baseline and end-term levels for all of the variables considered.

Health-seeking and sexual behaviours between the two levels by age groups

After controlling for age, it was observed that for the

sexually active 15-20 year-old girls there were significant differences (p<0.05) between baseline and end-term levels in the measures considered except for *having more than one sexual partners*as shown in table 3, below. However, the differences between the two levels for all the variables considered were significant for the participants aged 21-24 years.

Figure 3, above, shows the proportion of sexually active respondents who "always" used a condom during sex by age at baseline and end term levels

STI prevalence of BIG girls and other non-BIG girls in Mukuru Slums

Table 4, below, shows the results obtained by f comparing the STI prevalence of BIG project girls and other Mukuru community girls not part of any HIV-prevention project as observed during the STI campaign.

Non-BIG girls were almost 4 times as likely to have a sexually transmitted infection at midterm as were BIG project girls.

Table 3. Sexual Behaviours at Baseline and Endtime levels with Age- groups

Baseline				Endterm			Adjusted OR [a]	p-value
Sexually active 15-20 years old (N=132)				**Sexually active 15-20 years old (N=46)**			**(95% C.I)**	
	n	n/N	%	n	n/N	%		
Consistent, Correct Condom Use	22	22/132	17	34	34/46	74	4.435 (2.356-8.345)	p<0.0001*
Tested in the last 3 months	18	18/132	14	24	24/46	52	6.909 (3.222-14.814)	p<0.0001*
More than one sexual partners	8	8/132	6	2	2/46	4	0.704 (0.144-3.45)	p=0.665
Sexually active 21-24 years old (N=152)				**Sexually active 21-24 years old (N=57)**				
Consistent, Correct Condom Use	22	22/152	14.5	39	39/57	69	12.80 (6.242-26.261)	p<0.0001*
Tested in the last 3 months	48	48/152	32	35	35/57	61	3.447 (1.829-6.495)	p=0.0001*
More than one sexual partners	41	41/152	27	4	4/57	7	0.204(0.069-0.600)	p=0.004*

[a] Odds Ratios adjusted for age
CI=Confidence Interval
* significant (p=0.05) difference between the baseline and end-term results

Table 4. Comparing the STI prevalence of BIG Project beneficairies with other Mukuru Community girls

	S.T.I Screening	Treated for S.T.I	STI prevalence	OR (95% C.I)	p-value
B.I.G girls	79	8	10%	4.24 (1.73-10.39)	P=0.002
Community girls	65	21	32%		

The table 4 compares proportion of girls who needed STI treatment out of those who volunteered for STI screening among the BIG project beneficiaries and other Mukuru Community girls not in any HIV/STI prevention project

Pearson's correlation coefficients and p-values for select pairs of variables at end-term

The Pearson's correlation coefficients and p-values for pairs of select variables at endterm were: knowledge/income, 0.538 (p-value 0.000); knowledge/condom use, 0.409 (p-value 0.000); knowledge/"power" in sexual relationships, 0.164 (p-value 0.035); income/condom use, 0.358 (p-value 0.000); and income/ "power" in sexual relationships, 0.203 (p-value 0.009). The results showed significant (p=0.05) correlations for the pairs of variables considered.

DISCUSSION

Sexually active adolescent girls and young women in Mukuru Slums who participated in the integrated BIG project were significantly (p<0.05) more likely at end-term level to: have had more knowledge on HIV/STI, more "power'' in sexual relationships; and better attitude with respect to HIV and AIDS than at baseline level. Significant differences were also observed between the two levels for health-seeking and behavioural characteristics: tested for HIV in the last three months, consistent correct condom use; and having more than one sexual partners even after controlling for age except forthe lower age-group. This observation supports the efficacy of a package of evidence-based prevention interventions including change in social norms, economic empowerment and peer-mediated approaches as postulated by Kurth and Celum (2011), Jewkes et al. (2012) and Maticka-Tyndale and Barnett (2010).

The low score in condom use among the participants seemed to have been succesfully addressed by the BIG project as condom use increased from 17% at baseline and 77% at endterm. The low condom use at baseline corresponds to a low score (57%) in the "power" in sexual relationships by the girls, while the increased condom use corresponds to the higher score (82%) in "power" at endterm. This is consistent with the observation made by Higgins et al. (2010) and Dellar et al. (2015) on the effect of gender-power inequalities between men and women tothe vulnerability of women.

As observed by UNICEF (2011), low economic capacity of the slum girls reduces their resolve to preserve their health and makes them to rely on transactional sex. The Mukuru slums girls refer to older male sexual partners as "sponsors", depicting their dependence on the male counterparts for survival. High rates of HIV and other STIs are caused in part by the girls' inability to negotiate for safe sex and having multiple sexual partners. The improved behavioral outcomes observed at end-term may be related to the reduction of dependence of the girls on "sponsors" through the economic empowerment aspect of the BIG project. This is further supported by the significant correlation between "power" and income which is consistent with the view advanced by Seelay et al (2012) that there is value in providing interventions that address structural drivers that include economic forces

to this population.

The results seem to confirm what Kurth and Celum (2010) had postulated, that a HIV/STI prevention programcombining various arrays of strategies would have a higher efficacy than individual prevention interventions provided singly. These results also confirm the value of having programs that address power inequity between men and women as recommended by Jewkes and Morrel (2010); and empowering young, poor and least educated women to make decisions on health seeking as recommended by Mbonye et al. (2010).

The results are based on self-reported information which has been shown to be biased in some settings (Schroeder et al., 2003). To minimise this effect, the research assistants had been trained to use non-judgemental approaches. The fact that we observed a significant difference (p=0.002) between community girls and the BIG project girls with respect to STI prevalence seems to suggest that the bias introduced by the use of self-reported data did not mask key associations.

The findings support the argument for an integrated HIV/STI prevention, gender and lifeskills; and economic empowerment program for 15-24 year old adolescent girls and young women in urban informal settlements.

CONCLUSION AND RECOMMENDATIONS

The integrated HIV/STI prevention, gender and lifeskills; and economic empowerment project seemed to facilitate improvement in health/health information-seeking behavior; reduce the number of sexual partners; and increase correct and consistent use of condoms among the 15-24-year-old girls in Mukuru Slums. The authors recommend targeted messaging for the sexually active 15-20-year-old girls living in urban informal settlementson the need to reduce the number of sexual partners.The authorsalso recommend further studies that compare the outcomes of the integrated HIV-prevention project model with unintegrated ones in order to fully appreciate the effect.

ACKNOWLEDGEMENTS

The authors thank HOPE *worldwide*Kenya Bold Idea for Girls program staff for their dedicated effort; the Grand Challenges Canada for providing the funding for this research project (grant number S5-0422-01); and the the participants for their time and effort.

REFERENCES

Dellar RC, Dlamini S, Karim QA (2015). Adolescent girls and young women: key populations for HIV epidemic control. HIV and adolescents: focus on young key populations. 18 (1): 64-71.

Higgins JA, Hoffman S, Dworkin SL (2010). Rethinking gender, heterosexual men, and women's vulnerability to HIV/AIDS. American Journal of Public Health. 100(3):435-45.

Jewkes R, Dunkle K, Nduna M, Shai NJ (2012). Transactional sex and HIV incidence in a cohort of young women in the Stepping Stones Trial. Journal of AIDS and Clinical Research. 2012.

Jewkes R, Morrell R (2010). Gender and sexuality: emerging perspectives from the heterosexual epidemic in South Africa and implications for HIV risk and prevention. Journal of the International AIDS society.13(1):1.

Kabiru CW, Beguy D, Crichton J, Zulu EM (2011). HIV/AIDS among youth in urban informal (slum) settlements in Kenya: What are the correlates of and motivations for HIV testing? BMC Public Health. 11(685):1.

Kabiru CW, Beguy D, Undie CC, Zulu EM, Ezeh AC (2010). Transition into first sex among adolescents in slum and non-slum communities in Nairobi, Kenya. Journal of Youth Studies.13(4):453-471.

Karim QA, Kharsany AB, Leask K, Ntombela F, Humphries H, Frohlich JA, Samsunder N, Grobler A, Dellar R, Karim SS (2014). Prevalence of HIV, HSV-2 and pregnancy among high school students in rural KwaZulu-Natal, South Africa: a bio-behavioural cross-sectional survey. Sexually transmitted infections. 90(8):620-626.

Karim QA, Sibeko S, Baxter C (2010). Preventing HIV infection in women: a global health imperative. Clinical Infectious Diseases. 50 (Supplement 3):S122-129.

Kenya AIDS Indicator Survey Team (2012). National AIDS and STI Control Programme, Ministry of Health Kenya. 27-36

Kenya Demographic Health Survey Team (2014).*KAIS 201).*Government Printer. 255

Kurth AE, Celum C, Baeten JM, Vermund SH, Wasserheit JN (2011). Combination HIV prevention: significance, challenges, and opportunities. Current HIV/AIDS Reports. 8(1):62-72.

Madise NJ, Ziraba AK, Inungu J, Khamadi SA, Ezeh A, Zulu EM, Kebaso J, Okoth V, Mwau M (2012). Are slum dwellers at heightened risk of HIV infection than other urban residents? Evidence from population-based HIV prevalence surveys in Kenya. Health and place.18(5):1144-1152.

Maticka-Tyndale E, Barnett JP (2010). Peer-led interventions to reduce HIV risk of youth: a review. Evaluation and program planning.33(2):98-112.

Mbonye AK, Hansen KS, Wamono F, Magnussen P (2010). Barriers to prevention of mother-to-child transmission of HIV services in Uganda. Journal of biosocial science.42(02):271-283.

Nabukalu D, Klipstein-Grobusch K, Herbst K, Newell ML (2013). Mortality in women of reproductive age in rural South Africa. Global health action. 6:4-8

National AIDS Control Council (2015). *Kenya AIDS Strategic Framework*.Kenya Government Press. 8-10

Ott MQ, Bärnighausen T, Tanser F, Lurie MN, Newell ML (2011). Age-gaps in sexual partnerships: seeing beyond 'sugar daddies'. AIDS (London, England). 25(6):861.

Schroder KE, Carey MP, Vanable PA (2003). Methodological challenges in research on sexual risk behavior: I. Item content, scaling, and data analytical options. Annals of Behavioral Medicine.26(2):76-103.

Seeley J, Watts CH, Kippax S, Russell S, Heise L, Whiteside A (2012). Addressing the structural drivers of HIV: a luxury or necessity for programmes? Journal of the International AIDS Society. 15(Suppl 1).

UNICEF (2011). Opportunity in crisis: preventing HIV from early adolescence to young adulthood. UNICEF. 23