

# Risk of sexual, physical and verbal assaults on men who have sex with men and female sex workers in coastal Kenya

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**Background:** Violence toward MSM and female sex workers (FSW) is associated with HIV risk, and its prevention is prioritized in international HIV/AIDS policy.

**Methods:** Sociodemographic and behavioural data derived from HIV risk and follow-up cohorts including MSM and FSW in coastal Kenya between 2005 and 2014 was used to estimate the risk of rape, physical assault and verbal abuse, and to assess associations between first occurrence of assault with individual and recent behavioural factors.

**Results:** Incidence of first reported rape was similar for MSM [3.9, confidence interval (CI) 3.1–5.0 per 100 person-years (pyrs)] and FSW (4.8 CI 3.5–6.4 per 100 pyrs),  $P=0.22$ . Incidence of first reported physical and verbal assault was higher for FSW than MSM (21.1 versus 12.9 per 100 pyrs,  $P=0.14$  and 51.3 versus 30.9 per 100 pyrs,  $P=0.03$  respectively). Recent alcohol use was associated with reporting of all forms of assault by MSM [adjusted odds ratio (AOR) 1.8, CI 0.9–3.5] and FSW (AOR 4.4, CI 1.41–14.0), as was recent sale of sex for MSM (AOR 2.0, CI 1.1–3.8). Exclusive sex with men, active sex work, and group sex were also specifically associated with reporting rape for MSM. Perpetrators of sexual and verbal assault were usually unknown, whilst perpetrators of physical violence toward FSW were usually regular sexual partners.

**Conclusion:** MSM and FSW experienced a similarly high incidence of sexual assault in coastal Kenya, in addition to physical and verbal assault. Current national policies focus heavily on gender-based violence against women and young girls, but need to be inclusive of MSM and FSW.

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## Introduction

According to the United Nations, key populations at risk of HIV including MSM, sex workers, and persons who inject drugs face a high burden of violence [1], and violence both directly and indirectly increases HIV

infection risk [1–8]. Risks of sexual, physical, and verbal abuse are especially heightened for key populations, contributed to by the hazardous nature of sex work and drug use, criminalization of behaviours, and wider religious, political, and societal discrimination [7,8]. Victims who report being the subject of violence to

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health and police authorities may be met with ambivalence, reducing the incentive of victims to report assault [9–15].

The disproportionate burden of HIV in key populations in sub-Saharan Africa epidemics is now recognized [16–18]. In Kenya, which has a declining generalized HIV epidemic, approximately a third of all new HIV infections occur among MSM, female sex workers (FSW) and their immediate partners [19]. Homosexuality and sex work are criminalized, attract antipathetic political rhetoric, and arouse negative public opinion [10]. Retrospective studies suggest high levels of violence among MSM [20] and FSW [9] in Kenya. Here we report a direct comparison of the incidence of sexual, physical, and verbal assault among MSM, FSW, and other adults participating in a research cohort in coastal Kenya.

## Methods

### Study recruitment

The KEMRI research clinics based in Mtwapa and Kilifi, coastal towns north of Mombasa, enrolled adults into prospective cohort studies of HIV-positive and HIV-negative adults at high risk for HIV transmission [21,22]. Inclusion criteria were age 18–49 years, residence in the clinic catchment area, and evidence of high-risk sexual behaviour in the past 3 months (i.e., reported commercial sex work, multiple sexual partners, anal sex, a recent sexually transmitted infection, or an ongoing relationship with an HIV-positive partner). Enrolled participants were classified into four comparison groups: MSM, FSW and 'other' high risk men and women (non-MSM men and non-FSW women eligible by the other inclusion criteria outlined above).

### Study follow-up

Participants were followed-up at monthly or quarterly clinic visits. Clinic assessment included behavioural risk assessment and medical history elicited at a face-to-face interview, a standardized physical and genital examination, and HIV testing if hitherto seronegative. Recall of assault and characteristics of the last assailant were elicited during risk assessment. From 2005, participants were asked if they had experienced rape in the previous 3 months, defined as unwanted anal or vaginal penetrative intercourse with a male. In 2011, questions about recent physical assault and verbal abuse relating to sexual orientation or behaviour were introduced. Risk assessment also included recall of recent sexual behaviour and substance use.

### Statistical analysis

Incidence was defined as the average rate of first reported assaults occurring during follow-up. For participants who reported any assault, follow-up was censored at the

estimated date of first report of assault (mid-interval between visits) thus subsequent reports of assault were excluded from analysis. Otherwise follow-up was censored at the last documented clinic date, or the study end date (May 2014). Incidence was summarized for each enrolment group with 95% confidence intervals (CI) using Poisson regression. Kaplan–Meier survival functions were compared using log-rank tests. We used generalized estimating equations with a logit link function and exchangeable correlation structure to assess associations between individual or visit-level covariates and reported rape, physical assault, and verbal abuse for both MSM and FSW. Variables in crude association with outcomes ( $P < 0.10$ ) were retained in multivariate models. Stata version 11 (StataCorp, College Station, Texas, USA) was used for data cleaning and analysis.

### Ethics statement

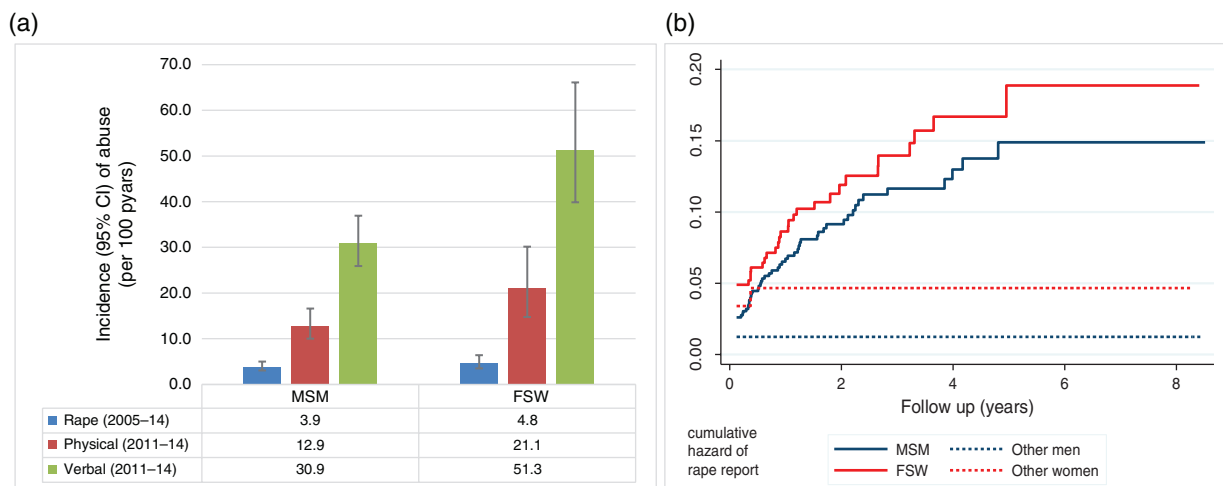
The study was approved by the ethical review board at the Kenya Medical Research Institute. All participants provided written informed consent.

## Results

From 2005 to 2014, 1425 participants (including 726 MSM and 367 FSW) contributed 3117 person-years of follow-up (pyrs). Sociodemographic characteristics of MSM and FSW were similar to each other (median age 25 and 26, respectively), but were younger, more educated and less likely to be in formal employment than other enrolled men and women (median age 29 and 28, respectively).

Between 2005 and 2014, 114 participants reported being raped. Six and half per cent of MSM were raped within 12 months of enrolment, versus 1.2% in non-MSM; rape incidence was significantly higher among MSM than among non-MSM male participants (3.9 versus 0.7 per 100 pyrs,  $P < 0.001$ ) (Fig. 1a). Rape incidence was also higher among FSW than in non-FSW women (4.8 versus 2.6 per 100 pyrs,  $P = 0.12$ ) and was not significantly different from incidence among MSM (Fig. 1a,  $P = 0.22$ ).

Between 2011 and 2014, 92 participants reported being the victim of physical assault and 184 of verbal abuse. Physical assault and verbal abuse were both more often reported than rape by both FSW and MSM (Fig. 1a). FSW reported a higher incidence of physical assault than MSM (21.1 versus 12.9 per 100 pyrs,  $P = 0.14$ ) and a significantly higher incidence of verbal abuse (51.3 versus 30.9 per 100 pyrs,  $P = 0.03$ ). Physical assault and verbal abuse were more common among MSM and FSW than among non-MSM men and non-FSW women respectively, though this difference was only statistically significant for verbal abuse toward men (MSM 30.9: versus other men: 0 per 100 pyrs,  $P = 0.01$ ).



**Fig. 1. (a) Incidence of first sexual, physical and verbal assault in MSM and FSW. (b) Nelson–Aalen plot of cumulative hazard of first rape (Kenya Coast, 2005–2014).**

Assailant characteristics were reported for all events after 2011. Most MSM assailants were unknown to the participant [81.9% rapes (9/11), 47.5% physical (29/61), 44.7% verbal (55/123)], and were only infrequently sexual partners [no rapes, 18% physical (11/61), 7.3% verbal (9/123)]. Verbal abuse toward FSW was mostly perpetrated by an unknown member of the public [35.0% (21/60)] or neighbour [33.3% (20/60)], yet physical assailants were most likely to be a regular sexual partner [53.3% (16/30)].

Table 1 shows the crude and adjusted associations with 64 MSM and 43 FSW rape events reported at 12 901 follow-up visits. Younger age was associated with MSM rape risk, with odds of rape declining by approximately 10% per increasing year of age. MSM rape risk was also associated with co-occurrence of a number of behaviours in the same interval, namely exclusive MSM behaviour, transactional sex, and group sex in the previous 3 months. The strongest adjusted association with rape was co-occurrence of group sex in the same period, which was reported at 7.8% of MSM visits. Most rape events were reported by MSM who also reported recent transactional sex (76.6% of rape events) and exclusive MSM behaviour (57.8% of rape events) in the same period, and both behaviours were independently associated with an approximately doubled risk of rape. Any alcohol use in the previous month was associated with higher crude risk of rape for both MSM and particularly for FSW. No other associations were observed for risk of rape among FSW.

Any alcohol use in the month prior to a visit was also strongly associated with risk of physical assault [adjusted odds ratio (AOR) MSM: 4.6, CI 1.6–13.0,  $P=0.004$ ; FSW: 12.3, CI 1.8–85.6,  $P=0.006$ ] and less strongly but still significantly with the risk of verbal abuse (AOR

MSM: 2.3, CI 1.1–4.6,  $P=0.02$ ; FSW: 7.3, CI 1.6–33.4,  $P=0.01$ ). Recent transactional sex was also associated with risk of physical assault for MSM (AOR 3.4, CI 1.5–7.8,  $P=0.003$ ), and strongly associated with risk of verbal abuse for both MSM and FSW (aOR MSM: 8.5, CI 4.3–16.8,  $P<0.001$ ; FSW: 15.0, CI 2.7–82.7,  $P=0.002$ ).

## Discussion

Our findings suggest that the individual risk of rape among MSM is similar to that experienced by FSW on the Kenya coast, and that both populations also experience significant risk of physical assault and verbal abuse related to sexual behaviour. The level of abuse reported by MSM and FSW participants is significant, especially when considered against the lower rates reported by the other cohort participants who are also at a higher risk of HIV infection when compared with the general population.

Okal estimates over 11 000 MSM and 29 500 FSW in Nairobi and were our findings generalizable, they would project that 430 MSM and 1416 FSW experience rape at least once per year in one city [23]. True burden of assault is likely to be higher, given that our methods exclude repeated rape reports and were based upon reports in face-to-face interviews, which may be subject to social desirability [24].

Comprehensive care for sexual violence should integrate medical treatment, psycho-social support and legal advice to access criminal justice mechanisms. Kenya has an exceptional record of delivery on post-rape service development, including national clinical guidelines,

Table 1. Association between individual factors and first rape (Kenya Coast, 2005–2014).

		MSM (n = 726)						Female sex workers (n = 367)					
		Relative risk of rape report at visit			Relative risk of rape report at visit			Relative risk of rape report at visit			Relative risk of rape report at visit		
		Adjusted <sup>b</sup>			Adjusted <sup>b</sup>			Adjusted <sup>b</sup>			Adjusted <sup>b</sup>		
		Rape reports/visits n/N	Crude OR	AOR	95% CI	Wald P		Rape reports/visits n/N	Crude OR	AOR	95% CI	Wald P	
<b>Individual characteristics</b>													
Age	Per year		0.86 <sup>c</sup>	0.89	0.84–0.96	0.001			0.94				
Asset index	Per item <sup>a</sup>		1.07						0.80				
Employment	Unemployed	21/2393	1.5					10/937	0.8				
	Waged /self-employed	43/6381	Ref					33/3170	Ref				
HIV status	Positive	17/1923	2.0					12/1599	0.6				
	Negative	47/6851	Ref					31/2508	Ref				
<b>Behavioural characteristics</b>													
Partner gender (past 3 months)	Men only	37/3011	2.6 <sup>c</sup>	2.0	1.0–3.8	0.026		39/3889	0.4				
	Men and women	27/5763	Ref					4/175	Ref				
Sold sex (past 3 months)	Yes	49/4394	3.1 <sup>c</sup>	2.0	1.1–3.8	0.049		38/2746	2.1				
	No	15/4365	Ref					5/1356	Ref				
Group sex (past 3 months)	Yes	22/677	7.1 <sup>c</sup>	4.9	2.6–9.3	<0.001		6/211	1.2				
	No	42/8055	Ref					37/3890	Ref				
Alcohol use (past 1 month)	Yes	47/5094	2.1 <sup>c</sup>	1.8	0.9–3.5	0.079		36/2427	4.4 <sup>c</sup>	4.4	1.41–14.0	0.011	
	No	17/3680	Ref					7/1673	Ref				
Injecting drug use (past 3 months)	Yes	1/50	3.1					0/2	–				
	No	63/8724	Ref					43/4105					

<sup>a</sup>Index of items possessed (television, radio, mobile phone, electricity supply, mains water supply, plumbed toilet).<sup>b</sup>Generalized estimating equations with logit link, visits grouped by individual, adjusted for tabled covariates.<sup>c</sup>Wald  $P < 0.100$  in bivariable analysis.

referral pathways, and chain of evidence systems [25,26]. Whereas our study did not determine whether or not rape victims sought services, current service models are currently oriented to meet the postviolence needs of women and children, and the accessibility and appropriateness of such models for the complex needs of MSM or sex workers now needs evaluation.

Our findings suggest associations with violence that may inform individual and contextual risk-reduction. Selling sex and alcohol use were consistently associated with higher incidence of all forms of assault, consistent with other studies [9,27,28]. Alcohol intoxication may pose direct risks through behavioural disinhibition and misreading of the risks implicit in contact with strangers [29]. Chersich *et al.* reported that binge drinking of alcohol was associated with violence risk among FSW in Mombasa and concurrent HIV risk behaviours [30]. As our measures were not specific to violence events, it is also plausible that these associations between sex work, alcohol use, and violence risk reflect periodic rather than concurrent associations. This could suggest that sex work negotiated in the context of alcohol-serving establishments presents more risk than brothel-based or home-based sex work. Further research should explore the utility of individual-level interventions to improve risk avoidance and resilience among MSM and FSW, as well as venue-based interventions targeting active sites of sex work negotiation and alcohol consumption.

Young age, exclusivity in male partners and experience of group sex were specifically identified as independent risk factors for rape among MSM. Behavioural studies of this cohort suggest that younger exclusive MSM tend to have higher casual male partner and client counts perhaps implying that risk of violence relates to more frequent exposure to risky situations [Smith AD *et al.* this issue]. However, examples outside Africa report a high risk of violence toward MSM adopting receptive anal sex roles and MSM exhibiting a more feminine appearance, suggesting a gendered element of sexual violence [31].

Whilst most physical violence against FSW was perpetrated by regular partners, as has been described elsewhere [32], perpetrators of MSM violence and FSW rape were generally unknown to the victim and suggest opportunistic aggression. Comprehensive prevention must therefore include structural interventions aimed squarely at eliminating any perceived legitimacy of violence and abuse perpetrated against minority populations. Current Kenyan policies prioritize key populations in the national HIV/AIDS response, and cite the need to reduce violence against these groups [33]. Yet HIV/AIDS policy is in contrast to messaging throughout Kenyan law criminalizing these populations, as well as to antipathetic political and religious opinion [34]. Such laws and commentary risk legitimizing discriminatory social and professional practices toward MSM and FSW in

an environment in which violence is tolerated. Redressing this status quo demands bold and unambiguous leadership [van der Elst *et al.* this issue].

The study had a number of limitations. Assault occurrence was measured across variable periods of follow-up, rather than as discrete events. Hence it was not possible to explore whether observed associations were with the circumstances of assault events or alternatively with risk of assault occurrence. Discordance between period of assault recall and visit intervals introduced the risk of duplicate reporting of assault, hence our decision to limit analysis to first reported occurrence of assault. Whilst this has advantages in comparing risk between individuals, it inevitably results in an underestimate of the total incidence and burden of assault through exclusion of repeated assault experience.

In conclusion, interventions to prevent violence toward key populations and deliver accessible care for victims need to be developed to complement existing services. Further research is also needed to clarify the direct and indirect consequences of violence on HIV and other health risks, including psychological and social wellbeing.

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## Role of investigators

M.M. drafted the manuscript and supported patient care in Mtwapa. S.R. and M.D. conducted data analysis and contributed to the draft of the manuscript. E.W. ensured data management, and conducted data analysis. E.vdE. and E.G. strengthened community engagement of MSM and FSW in Mtwapa. S.G. and E.S. designed the cohort studies of MSM and FSW in Mtwapa and provided study oversight. A.S. helped design the study, conducted data analysis, and drafted the manuscript. All authors provided input into and approved the final manuscript.

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## Conflicts of interest

All authors declare no conflicts of interest.

## References

- UNAIDS. The Gap Report. Geneva, Switzerland: UNAIDS; 2014.
- Bogart LM, Collins RL, Cunningham W, Beckman R, Golinelli D, Eisenman D, et al. **The association of partner abuse with risky sexual behaviors among women and men with HIV/AIDS.** *AIDS Behav* 2005; **9**:325–333.
- Gielen AC, Ghandour RM, Burke JG, Mahoney P, McDonnell KA, O'Campo P. **HIV/AIDS and intimate partner violence: intersecting women's health issues in the United States.** *Trauma Violence Abuse* 2007; **8**:178–198.
- Illangasekare S, Burke J, Chander G, Gielen A. **The syndemic effects of intimate partner violence, HIV/AIDS, and substance abuse on depression among low-income urban women.** *J Urban Health* 2013; **90**:934–947.
- Machtiger EL, Wilson TC, Haberer JE, Weiss DS. **Psychological trauma and PTSD in HIV-positive women: a meta-analysis.** *AIDS Behav* 2012; **16**:2091–2100.
- Maman S, Campbell J, Sweat MD, Gielen AC. **The intersections of HIV and violence: directions for future research and interventions.** *Soc Sci Med* 2000; **50**:459–478.
- Shannon K, Strathdee SA, Goldenberg SM, Duff P, Mwangi P, Rusakova M, et al. **Global epidemiology of HIV among female sex workers: influence of structural determinants.** *Lancet* 2015; **385**:55–71.
- Baral SD, Friedman MR, Geibel S, Rebe K, Bozhinov B, Diouf D, et al. **Male sex workers: practices, contexts, and vulnerabilities for HIV acquisition and transmission.** *Lancet* 2014; **385**:260–273.
- Okal J, Chersich MF, Tsui S, Sutherland E, Temmerman M, Luchters S. **Sexual and physical violence against female sex workers in Kenya: a qualitative enquiry.** *AIDS Care* 2011; **23**:612–618.
- Scorgie F, Vasey K, Harper E, Richter M, Nare P, Maseko S, et al. **Human rights abuses and collective resilience among sex workers in four African countries: a qualitative study.** *Global Health* 2013; **9**:33.
- Niang CI, Tapsoba P, Weiss E, Diagne M, Niang Y, Moreau AM, et al. **'It's raining stones': stigma, violence and HIV vulnerability among men who have sex with men in Dakar, Senegal.** *Cult Health Sex* 2003; **5**:499–512.
- van der Elst EM, Gichuru E, Omar A, Kanungi J, Duby Z, Midoun M, et al. **Experiences of Kenyan healthcare workers providing services to men who have sex with men: qualitative findings from a sensitivity training programme.** *J Int AIDS Soc* 2013; **16** (Suppl 3):18741.
- FIDA. Documenting Human Rights Violations of Sex Workers in Kenya: A study conducted in Nairobi, Kisumu, Busia, Nanyuki, Mombasa and Malindi *HIV/AIDS policy & law review/Canadian HIV/AIDS Legal Network* 2008; **12**:76–77.
- Ombeni AM, Crago AL. **Violence against sex workers by police and military in Democratic Republic of Congo.** *HIV AIDS Policy Law Rev* 2008; **13**:73–74.
- Fawole OI, Dagunduro AT. **Prevalence and correlates of violence against female sex workers in Abuja, Nigeria.** *Afr Health Sci* 2014; **14**:299–313.
- Baral S, Beyrer C, Muessig K, Poteat T, Wirtz AL, Decker MR, et al. **Burden of HIV among female sex workers in low-income and middle-income countries: a systematic review and meta-analysis.** *Lancet Infect Dis* 2012; **12**:538–549.
- Mathers BM, Degenhardt L, Phillips B, Wiessing L, Hickman M, Strathdee SA, et al. **Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review.** *Lancet* 2008; **372**:1733–1745.
- Smith AD, Tapsoba P, Peshu N, Sanders EJ, Jaffe HW. **Men who have sex with men and HIV/AIDS in sub-Saharan Africa.** *Lancet* 2009; **374**:416–422.
- Gelmon L, Kenya P, Oguya F, Cheluget B, Haile G. *Kenya HIV Prevention Response and Modes of Transmission Analysis*: Kenya National AIDS Control Council; 2009.
- Onyango-Ouma W, Birungi H, Geibel S. **Understanding the HIV/STI risks and prevention needs of men who have sex with men in Nairobi, Kenya.** Washington, DC: Population Council; 2005.
- Sanders EJ, Okuku HS, Smith AD, Mwangome M, Wahome E, Fegan G, et al. **High HIV-1 incidence, correlates of HIV-1 acquisition, and high viral loads following seroconversion among men who have sex with men in coastal Kenya.** *AIDS (London, England)* 2013; **27**:437.
- Graham SM, Mugo P, Gichuru E, Thiong'o A, Macharia M, Okuku HS, et al. **Adherence to antiretroviral therapy and clinical outcomes among young adults reporting high-risk sexual behavior, including men who have sex with men, in coastal Kenya.** *AIDS Behav* 2013; **17**:1–11.
- Okal J, Geibel S, Muraguri N, Musyoki H, Tun W, Broz D, et al. **Estimates of the size of key populations at risk for HIV infection: men who have sex with men, female sex workers and injecting drug users in Nairobi, Kenya.** *Sex Transm Infect* 2013; **89**:366–371.
- Van der Elst EM, Okuku HS, Nakamya P, Muhaari A, Davies A, McClelland RS, et al. **Is audio computer-assisted self-interview (ACASI) useful in risk behaviour assessment of female and male sex workers, Mombasa, Kenya.** *PLoS One* 2009; **4**:e5340.
- Kilonzo N, Theobald SJ, Nyamato E, Ajema C, Muchela H, Kibaru J, et al. **Delivering posttrauma care services: Kenya's experience in developing integrated services.** *Bull World Health Organ* 2009; **87**:555–559.
- Ministry of Public Health, Ministry of Medical Services. **National guidelines on management of sexual violence in Kenya.** Nairobi, Kenya: Government of Kenya; 2009.
- Okal J, Luchters S, Geibel S, Chersich MF, Lango D, Temmerman M. **Social context, sexual risk perceptions and stigma: HIV vulnerability among male sex workers in Mombasa, Kenya.** *Cult Health Sex* 2009; **11**:811–826.
- Muraguri N, Tun W, Okal J, Broz D, Raymond HF, Kellogg T, et al. **HIV and STI prevalence and risk factors among male sex workers and other men who have sex with men in Nairobi, Kenya.** *J Acquir Immune Defic Syndr* 2015; **68**:91–96.
- Kalichman SC, Simbayi LC, Kaufman M, Cain D, Jooste S. **Alcohol use and sexual risks for HIV/AIDS in sub-Saharan Africa: systematic review of empirical findings.** *Prev Sci* 2007; **8**:141–151.
- Chersich MF, Luchters SM, Malonza IM, Mwarogo P, King'ola N, Temmerman M. **Heavy episodic drinking among Kenyan female sex workers is associated with unsafe sex, sexual violence and sexually transmitted infections.** *Int J STD AIDS* 2007; **18**:764–769.
- Betron M, Gonzalez-Figueroa E. **Gender identity, violence and HIV among MSM and TG: a literature review and a call for screening.** Washington, DC: Futures Group International, USAID; 2009.
- Pack AP, L'Engle K, Mwarogo P, Kingola N. **Intimate partner violence against female sex workers in Mombasa, Kenya.** *Cult Health Sex* 2013; **16**:217–230.
- Kenya Ministry of Health. *Kenya HIV Prevention Revolution Road Map: Countdown to 2030.* 2014.
- Li Y, Marshall CM, Rees HC, Nunez A, Ezeanolue EE, Ehiri JE. **Intimate partner violence and HIV infection among women: a systematic review and meta-analysis.** *Journal of the international AIDS society* 2014; **17**.