

# High-risk sex and displacement among refugees and surrounding populations in 10 countries: the need for integrating interventions

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**Introduction:** Between 2004 and 2012, the United Nations High Commissioner for Refugees conducted behavioural surveillance surveys in 27 separate communities in 10 countries.

**Methods:** Random systematic or two-stage cluster sampling was used among participants of age 15–49 years, using a modified standard questionnaire. We conducted descriptive data analysis and multivariable logistic regression to identify factors independently associated with multiple sexual partnerships.

**Results:** Of 27 sites surveyed comprising 24 219 individuals, 11 refugee and surrounding communities were paired. Recent displacement comprised less than 10% of participants. Visiting neighbouring communities varied from 8.6 to 74.4%. Multiple sexual partnerships varied from 2.7% in Sudan to 32.5% in Tanzania. Condom use during last sex was low in most of the communities (<5%). The prevalence of forced sex was similar in paired sites, with intimate partner violence being the most frequent, ranging between 1.0 and 4.6% in camps and 0.8 and 3.6% in communities, with the exception of Nepal (10.8 and 9.8%). Being away from home for more than 1 month and having lived in community for less than 12 months was associated with multiple partnerships in six and five of 16 sites, respectively.

**Conclusion:** In the largest study of paired sites of refugees in protracted refugee camps and surrounding nationals, data showed no consistent difference in levels of risky sexual behaviour and there was much variation among the different groups. The prevention strategies should be targeted in a highly integrated manner for both the communities. Forced sex among women was reported at similar levels among refugees and nationals, with intimate partner violence being the most common. These findings should reduce stigma and discrimination against refugees.

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*AIDS* 2014, **28**:000–000

**Keywords:** behavioural surveillance surveys, HIV, multiple partners, refugees, surrounding populations

## Introduction

At the end of 2011, there were 15.2 million refugees worldwide, and 80% were hosted in low-income countries where HIV is often a major public health concern [1]. Nearly half of refugees worldwide live in protracted displacement settings where they have been in exile for at least 5 years; many of them lived for 15 years or more [1]. (Refugees are people who have been forced to

leave their homes to avoid the effects of armed conflict, generalized violence, violations of human rights or natural or human-made disasters and who have crossed an international border; internally displaced persons (IDPs) have been forced to flee for similar reasons but have not crossed an international border.) Movement in and out of refugee camps and interactions with neighbouring national communities are commonplace despite policies that often attempt to restrict such mobility.

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Received: 31 August 2013; revised: 17 October 2013; accepted: 17 October 2013.

DOI:10.1097/QAD.0000000000000118

The prevalence of HIV is geographically varied [2], but mobility is generally considered an important driver of the epidemic [3], as mobile populations are assumed to differ from stable ones in terms of their social and structural experiences and consequently in terms of their risk of HIV exposure [4]. However, only a few studies have considered the potentially dynamic role of mobility on HIV transmission [3]. In fact, the relationship between displacement and HIV infection may vary depending on the context. Mobility may well drive infection in contexts in which basic necessities, security, the right to work, social cohesion and protection against sexual violence are reduced or lacking [5]. By contrast, where mobile populations move into areas with lower HIV infection, have access to better services and information on HIV infection, mobility may have a 'protective' effect on transmission [5]. Notably, postconflict settings characterized by improved economies and road structures, likely represent the most critical period of the HIV risk in the displacement continuum; this in terms of linking geographically separate epidemics and intensifying transmission [6].

HIV prevention efforts in protracted refugee and postconflict settings have matured in recent years, and as part of these efforts, the United Nations High Commissioner for Refugees (UNHCR) along with the Great Lakes Initiative for HIV and the World Bank embarked on a process of monitoring the prevalence of risky and protective behaviours related to HIV and access to services. This was primarily through conducting a series of HIV behavioural surveillance surveys (BSS) to establish baseline levels of risky and protective behaviours, against which changes overtime could be evaluated. This initiative represents the most comprehensive effort to date to improve our understanding of HIV behaviour-related risk, as well as the important interactions between refugee and surrounding populations.

Since 2004, UNHCR has conducted baseline BSS in 27 separate communities in 10 countries [1]. In this article, we present a synthesis of these results. The aim is three-fold. First, we examine the differences between refugees and surrounding populations in terms of sexual risk and access to services. Second, we examine the relationship between multiple sexual partnerships and mobility, as well as displacement. Finally, we examine the differences in risky sex and access to services between never-displaced populations living in South Sudan, IDPs and repatriated refugees living in the same communities and current South Sudanese refugees living in camps in Kenya and Uganda.

## Methods

### Data collection

#### *Sampling*

Participants were at least 15–49 years of age and living and sharing meals in the household for at least 14 days

prior to the interview. In eastern Sudan and Nepal where we had access to complete listing of survey populations, we collected data using random systematic sampling. Otherwise, representative samples were selected using two-stage cluster sampling, where we calculated an unadjusted sample size per strata to enable detection of a 15% change at follow-up in the 15–24-year-old strata for two main variables: condom use with last casual partner and comprehensive knowledge about HIV. This sample size was further adjusted upwards by a factor two to account for the potential clustering effect. Regardless of sampling design, each sample size was adjusted upwards by a further 15–20% to account for anticipated nonresponse. We made at least three attempts to interview household members, and where all members were absent we did not replace the household but coded as absent.

#### *Questionnaire*

We developed a standard questionnaire for HIV behavioural surveillance, administered by an interviewer, among displaced persons and their surrounding populations [7]. In addition to sexual history, condom use, forced sex, HIV knowledge and testing, we asked about length and type of refugee displacement and type and frequency of interaction between refugees and surrounding populations. In each site we pretested the questionnaire and modified it when necessary. In doing so we tried to maximize comparability across sites while ensuring that the questionnaire was appropriate to each local context. Overtime, we added some questions not included in the first version of questionnaire. Hence, in the earliest surveys data a few variables were not available. This is noted in the article wherever applicable.

#### **Ethical considerations**

The ethics approval was sought and obtained from the relevant national ethics committee in each country. Verbal informed consent was obtained from each participant. Participation was voluntary.

#### **Processing and analysis**

We collected data using paper questionnaires, which were then transported to the UNHCR central offices, where data were entered using epiData or similar software. We stored and backed up the digital datasets centrally in the UNHCR headquarters in Geneva. We conducted descriptive data analysis using Stata 10 software (Stata Corp, College Station, Texas, USA). We used a simple descriptive analysis and logic checks to detect out of range and illogical response in the data. Where an error could not be resolved that data point was dropped. Here we present the summary statistics for several core indicators related to exposure to sexual intercourse and sexual risk behaviours (sexual debut and abstinence among youth), forced sex, type and number of sex partners; knowledge and attitudes about HIV transmission; use of services for HIV testing; and displacement and mobility. The proportions and associated sample sizes and 95%

confidence intervals for each of the key indicators are also presented. Information on cluster assignment was not available in five sites (Kenya 1, Mozambique, Rwanda, Kayaka, Uganda and Zambia). Therefore, the confidence intervals reported might be narrower than, if they were adjusted for the design effect potentially associated with the cluster design. We conducted multivariable logistic regression analysis to identify factors independently associated with multiple sexual partnerships. In paired sites, where a camp and surrounding populations were surveyed, we investigated an additional variable related to social interaction between the two communities. Variables thought to be highly correlated were cross-tabulated to investigate colinearity. Two tests for colinearity, tolerance and variance inflation factor were calculated to test the strength of variable interrelationships. If collinear variables were identified, one variable, that with the strongest association with the outcome, was chosen to represent the collinear variables in the regression.

## Results

### Survey sites

We surveyed 24 219 individuals living in 27 communities from nine countries in Africa and Nepal between 2004 and 2012 (Table 1). Table 1 identifies sites and year in which each survey was undertaken and provides additional site-level information. Of the 27 sites surveyed, 22 represented 11 refugee and surrounding population pairings. The remaining five were not part of a paired survey. Specifically, in three refugee camps (Dukwi in Botswana, Dadaab in Kenya and Marratane in Mozambique) we only surveyed camp populations. Additionally, in the two South Sudanese sites (Juba municipality and Kajo Keji town), there were no refugee camps; instead, the population was South Sudanese who were either never-displaced, IDPs or were repatriated refugees. Each site in Table 1 will henceforth be referred to by the name of the country in which the survey was conducted and the

**Table 1. Survey characteristics.**

Country	Year of survey	Population	Site	Additional information for camps	
				Year camp Established	Proportion of survey respondents from the primary country of refugee origin
Botswana	2012	Refugees	Dukwi	1978	Zimbabwean (31%), Namibian (31%)
Kenya (1)	2009	Refugees	Dadaab	1991	Somalia (93%)
Kenya (2)	2004	Refugees	Kakuma	1992	South Sudan (69%)
Mozambique	2005	Surrounding villages Refugees	Marratane	N/A 2001	Democratic Republic of Congo (77%)
Nepal	2005	Refugees	Jhapa and Morang	1992	Bhutanese (99%)
Rwanda	2004	Surrounding villages Refugees	Kiziba	N/A 1996	Democratic Republic of Congo (98%)
Sudan	2010	Surrounding villages Refugees	Rubazo and Kagabiro Wad Sharifey	N/A 2004 consolidation of camps	Eritrea (87%)
South Sudan	2007	Surrounding villages Nondisplaced, internally displaced and repatriated Southern Sudanese refugees	Kassala Juba	N/A N/A	
South Sudan	2010	Nondisplaced and repatriated Southern Sudanese refugees	Kajo Keji	N/A	
Tanzania (1)	2005	Refugees	Lukole	1994	Burundi (99%)
Tanzania (2)	2005	Surrounding villages Refugees	Ngara Lugufu	N/A 1997	Democratic Republic of Congo (99%)
Uganda (1)	2006	Surrounding villages Refugees	Kigoma Kyangwali	N/A 1964	South Sudan (60%)
Uganda (2)	2006	Surrounding villages Refugees	Hoima Nakivale and Orunchinga	N/A 1959	Rwandan (83%)
Uganda (3)	2009	Surrounding villages Refugees	Mbarara Kyaka	N/A 1983	Democratic Republic of Congo (92%)
Zambia (1)	2006	Surrounding villages Refugees	Kyanjojo Kala	N/A 2000	Democratic Republic of Congo (92%)
Zambia (2)	2006	Surrounding villages Refugee	Kawamba Mwange	N/A 1999	Democratic Republic of Congo (99%)
		Surrounding villages	Mporokoso	N/A	

type of setting (e.g. Lugufu camp in Tanzania will be referred to as Tanzania (2) camp).

### Sociodemographic characteristics

The median proportion of women surveyed ranged between 42.5% in Mozambique and 70.4% in Sudan. The gender profile was similar when comparing camps to surrounding populations, as were age structures except in three camps where a higher proportion of 15–24-year-olds were surveyed. Recent displacement, defined as having lived in the current community for less than a year, generally comprised less than 10% of participants. The frequency of visiting surrounding populations varied from as low as 8.6% in Kenya (1) camp to a high of 74.4% in the Nepalese camp; the latter being the only site where refugees were more likely to visit surrounding populations. The main reasons for visiting the surrounding populations was shopping/trading or visiting family and friends (Table 1 supplemental, <http://links.lww.com/QAD/A460>). The proportion of participants who reported a short-term mobility (travelling away from home for more 4 weeks in the past 12 months) ranged mostly between 15 and 25% (Table 2). The short-term mobility was relatively high among Kenya (2) surrounding populations and in Rwanda's camp and hosts (46.7, 34.5 and 36.0%, respectively) (Table 2). The main reason for travelling away from home was to visit family, friends or relatives (Table 1 supplemental, <http://links.lww.com/QAD/A460>).

### Higher risk sex

The prevalence of multiple sexual partnerships was variable across sites (Fig. 1a). The highest prevalence was reported in the Tanzania (2) camp and surrounding population (32.5 and 22.4%, respectively), whereas the lowest was in the Sudan camp and surrounding population (2.7 and 3.7%, respectively) (Fig. 1a). There was a statistically significant difference ( $P < 0.05$ ) in the prevalence of multiple partnerships in only three paired camp and host sites (Figs. 1a). Condom use during last sex among those who reported having multiple sexual partnerships in the past 12 months was low (<5%) in the refugee camps (Fig. 1a), with the exception of the Tanzania (2) and Botswana camps. Similarly in the noncamp communities, condom use was mostly below 5%, except in Zambia (1) and South Sudan (2), where condom use was 8.9 and 11.1%, respectively (Fig. 1a).

The proportion of unmarried 15–24-year-olds, who had never had sex, was highest (92.7%) in Kenya (1) camp and lowest (33.0%) in the Tanzania (2) camp. Overall, the levels of abstinence were similar in the camps and surrounding populations, except in Tanzania and Zambia (1) (Fig. 1b). Approximately 25% of 15–24-year-olds in the Tanzania (2) camp reported having sex before they were 15 years old (Fig. 1b), which was significantly higher than the surrounding community (6.6%). Kenya (2) was

the only other site with significant difference between the two communities.

The highest prevalence of women who were forced to have sex in the past 12 months was in Nepal (10.8 and 9.8, camp and surrounding population, respectively); it was also relatively high in Tanzania (2) camp (4.6%). Otherwise, forced sex ranged between 1.0 and 3.1% in camps and 0.8 and 3.6% in surrounding populations. The most frequently identified perpetrator of forced sex was one's own regular partner (data not shown). The surrounding populations in Uganda (3) was the only one where prevalence of forced sex was significantly higher in the refugee camp [7.2%, 95% confidence interval (CI) 5.14–9.31 and 2.3%, 95% CI 0.9–3.7].

### Testing and knowledge

HIV testing was lowest in Nepal (2.1 and 3.9%, camp and surrounding populations, respectively) and highest in Botswana camp (47.6%) (Fig. 1c). Testing in camps was significantly higher in Kenya (2), Uganda (3) and in both sites in Tanzania than in surrounding populations (Fig. 1c). Comprehensive HIV knowledge was lowest in Sudan and highest in Rwanda and Zambia. Unexpectedly, comprehensive knowledge was significantly lower in camps than in surrounding populations in Tanzania (1) and in both sites in Zambia (Fig. 1c).

### Independent predictors of multiple partnerships

We examined the association between multiple sexual partnerships in the past 12 months, recent displacement and mobility in 16 sites in a logistic regression shown in Table 3 as well as in five nonpaired sites (Table 2 supplemental, <http://links.lww.com/QAD/A460>).

In the paired sites, refugees had significantly lower odds of multiple sexual partnerships ( $P < 0.05$ ) than surrounding populations in Tanzania (1) and all Ugandan camps. Conversely, being a refugee was associated with increased odds of multiple partnerships in Tanzania (2) [adjusted (a) odds ratio (OR) 1.46, 95% CI 1.13–1.88] and Zambia (2) (aOR 1.55, 95% CI 1.03–2.34) (Table 3). Visiting the neighbouring community, regardless of refugee status, was associated with having multiple partners in five of 11 paired sites (Table 3).

Being away from home for 1 month or more in the past 12 months was associated with multiple partnerships in three of the paired sites (Table 3) and three of the unpaired sites (Table 2 supplemental, <http://links.lww.com/QAD/A460>). The largest association between extended travel away from home and multiple partnerships was in Kenya (1) (aOR 3.89, 95% CI 1.76–8.61) and the smallest was in Kenya (2) (aOR 2.13, 95% CI 1.66–2.73). Moreover, having lived in the community for less than 12 months was associated with multiple partnerships in

**Table 2. Prevalence of recent displacement, mobility away from home and interaction with the neighbouring community.**

Country	Location	Site	N	Resided 12 months or less in the current community	Visit adjacent community one or more times per month	Away from home for more than 1 month in the past 12 months
Botswana	Dukwi	Camp	357	5.7% 3.7–7.6%	53.5% 49.3–57.6%	23.0% 19.5–80.5%
Kenya (1)	Dadaab	Camp	1117	20 3.2% 2.0–5.2%	191 8.6% 6.4–11.4%	82 16.4% 13.0–20.5%
Kenya (2)	Kakuma	Camp	1669	36 11.0% 9.5–12.5%	96 11.4% 16.2–21.3%	67 20.6% 18.7–22.6%
Kenya (2)	Kakuma	Host	1680	193 11.5% 10.0–13.0%	191 69.5% 67.3–71.7%	344 46.7% 44.3–49.1%
Mozambique	Marratane	Camp	737	193 4.3% 2.9–5.8%	1168 42.3% 38.7–45.9%	784 18.6% 15.8–21.5%
Nepal	Jhapa and Morang	Camp	800	32 0.1% 0.01–0.4%	305 74.4% 71.3–77.4%	133*** 17.3% 14.6–19.9%
Nepal	Jhapa and Morang	Host	800	1 3.1% 1.9–4.3%	595 36.6% 33.3–40.0%	138 17.0% 14.4–19.6%
Rwanda	Kiziba	Camp	1033	25 4.7% 3.4–6.0%	293 NA	136 34.5% 31.7–37.5%
Rwanda	Rubazo and Kagabiro	Host	1046	49 6.9% 5.4–8.4%	NA	357 36.0% 33.1–39.0%
South Sudan	Juba	municipal	809	72 9.8% 6.9–13.6%	NA	377 17.3% 13.8–21.4%
South Sudan	Kajo Keji	returnees	949	79 16.7% 12.5–21.8%	NA	139 24.2% 20.1–28.9%
Sudan	Wad Sharifey	Camp	294	158 1.7% 0.2–3.2%	42.9% 37.2–48.6%	230 15.7% 11.5–19.8%
Sudan	Kassala	Host	542	5 2.6% 1.4–4.9%	126 55.9% 51.0–60.7%	46 25.7% 21.4–30.5%
Tanzania (1)	Lukole	Camp	875	14 3.2% 2.0–4.4%	303 19.4% 16.8–22.1%	139 6.5% 4.9–8.2%
Tanzania (1)	Ngara	Host	818	28 4.4% 1.9–10.1%	170 43.2% 35.2–51.5%	57 12.1% 9.4–15.4%
Tanzania (2)	Lugufu	Camp	761	36 0.8% 0.2–1.4%	353 16.6% 13.9–19.2%	99 22.3% 19.4–25.3%
Tanzania (2)	Kigoma	Host	929	6 6.8% 5.2–8.4%	126 22.6% 19.9–25.3%	170 16.5% 14.1–18.0%
Uganda (1)	Kyangwali	Camp	825	63 5.3% 3.6–7.9%	210 24.9% 20.1–29.4	153 9.1% 6.9–12.0%
Uganda (1)	Hoima	Host	678	44 18.4% 13.5–24.7%	202 23.3% 19.1–28.1%	75 9.9% 7.2–13.4%
Uganda (2)	Nakivale and Oruchinga	Camp	1096	125 8.9% 5.3–14.4%	158 32.8% 27.8–38.2%	67 10.9% 8.8–13.4%
Uganda (2)	Mbarara	Host	1022	97 7.6% 6.0–9.7%	359 35.4% 30.6–40.6%	119 20.3% 17.6–23.2%
Uganda (3)	Kyaka	Camp	839	78 8.0% 6.2–9.8%	362 26.0% 37.7–47.5%	207 19.9% 17.2–22.6%
Uganda (3)	Kyenjojo	Host	1103	67 9.3% 7.5–11.0%	218 33.2% 49.8–58.9%	167 16.3% 14.1–18.5%

Table 2 (continued)

Country	Location	Site	N	Resided 12 months or less in the current community	Visit adjacent community one or more times per month	Away from home for more than 1 month in the past 12 months
Zambia (1)	Kala	Camp	814	102	366	180
				1.4%	54.9%	17.9%
Zambia (1)	Kawamba	Host	878	0.6–2.2%	51.5–58.3%	15.2–20.5%
				11	526	145
Zambia (1)	Kawamba	Host	878	6.4%	59.9%	22.8%
				4.8–8.0%	56.7–63.2%	20.0–25.6%
Zambia (2)	Mwange	Camp	905	56	511	200
				0.3%	56.6%	19.5%
Zambia (2)	Mwange	Camp	905	0.0–0.7%	53.3–59.7%	16.7–22.0%
				3	511	176
Zambia (2)	Mporokoso	Host	843	4.5%	60.4%	17.9%
				3.1–5.9%	57.1%–63.7%	15.3–20.5%
				38	509	151

three paired sites (Table 3) and two unpaired sites (Table 2 supplemental, <http://links.lww.com/QAD/A460>). The degree of association ranged between the largest in Nepal (aOR 2.33, 95% CI 1.22–4.46) and smallest in Uganda

(1) (aOR 1.33, 95% CI 1.04–1.71) (Table 3). The sociodemographic characteristics associated with higher odds of multiple partnerships in most sites were being male and being married (Table 3).

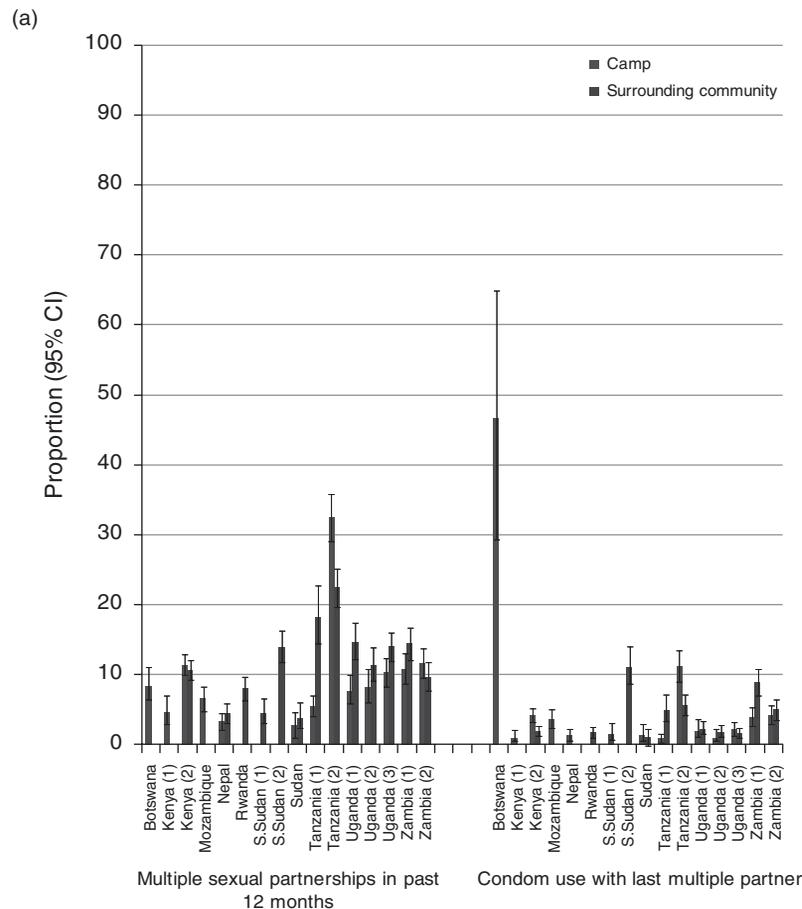


Fig. 1. HIV-risky behaviour, testing and knowledge by site. (a) Reported multiple partnership in the past 12 months and condom use with last multiple partner (among 15–49-year olds) and early-age sexual debut before 15 years and abstinence (among 15–24-year olds). (b) Reported early sexual debut and sex before marriage, among 15–24-year-old refugee and surrounding population respondents. (c) HIV testing and comprehensive knowledge among 15–49-year-old respondents in the camp and surrounding community. CI, confidence interval.

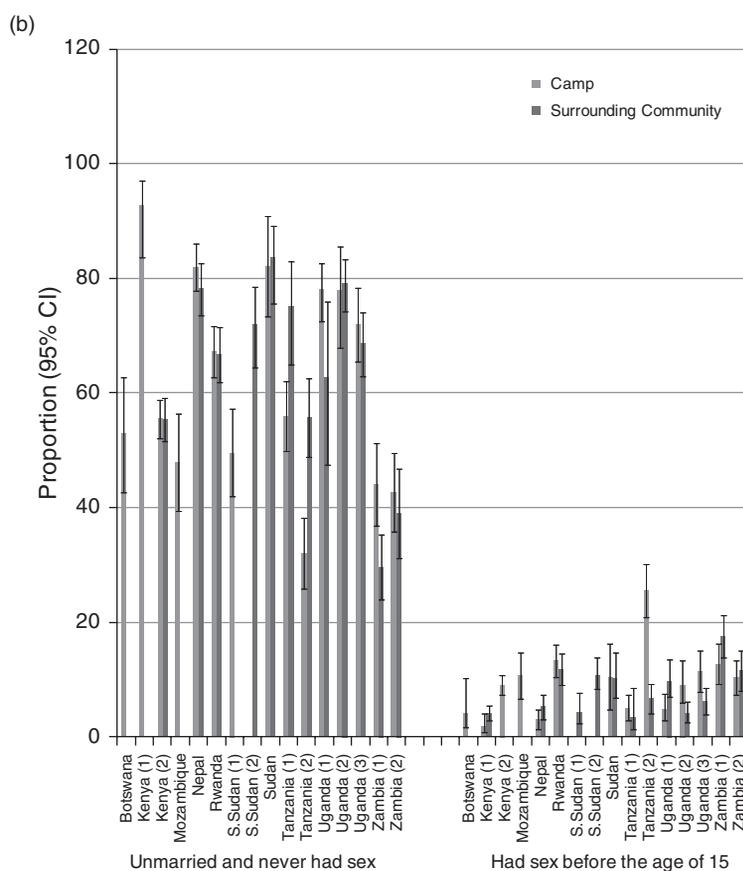


Fig. 1. (Continued).

### Comparison of never displaced, internally and externally displaced South Sudanese

Juba residents who were never forcibly displaced or who were internally displaced into Juba town reported the lowest levels of multiple sexual partnerships and casual sex (Fig. 2). Unsurprisingly, HIV testing was also lowest (2.1%) among those never displaced (Fig. 2). Although perhaps unexpectedly, refugees living in Hoima, Uganda, and Kakuma, Kenya, had significantly lower level of comprehensive HIV knowledge than those never-displaced or IDPs living in Juba (Fig. 2).

## Discussion

Among the largest sample of refugees and nationals surveyed to date, there was no evidence that refugees reported consistently higher levels of risky sexual partnerships than host nationals living the surrounding communities; in fact, the opposite was more often true. Multiple sexual partnerships were associated with recent displacement in 30% of surveyed sites. However, reflecting the protracted nature of most camps surveyed, refugees experienced limited and no higher levels of recent displacement compared to surrounding

populations, with the overwhelming majority having lived in their community for at least 1 year.

Like recent displacement, visiting the neighbouring community at least once a month was associated with higher odds of sexual partnerships in approximately 30% of sites, whereas being away from home for at least a month in the past 12 months was associated with risky sex in almost 40% of sites. However, unlike recent displacement, and in spite of laws limiting the movement of refugees, visiting the neighbouring community and travelling for extended period away from home for trade and to visit family and friends were fairly common among refugees and surrounding populations alike. In these settings, the short-term mobility likely expanded sexual networks and provided more disposable income potentially facilitating multiple partnerships [8].

Our study cannot delineate whether the short-term mobility causes multiple partnerships or the converse. However, given the ubiquity of interaction between communities and extended travel away from home, HIV prevention efforts should be highly integrated between camp and host populations and expanded beyond the more traditional facility based model, which often targets those who are attending health clinics, perhaps to the exclusion of men who are highly mobile, and in a more

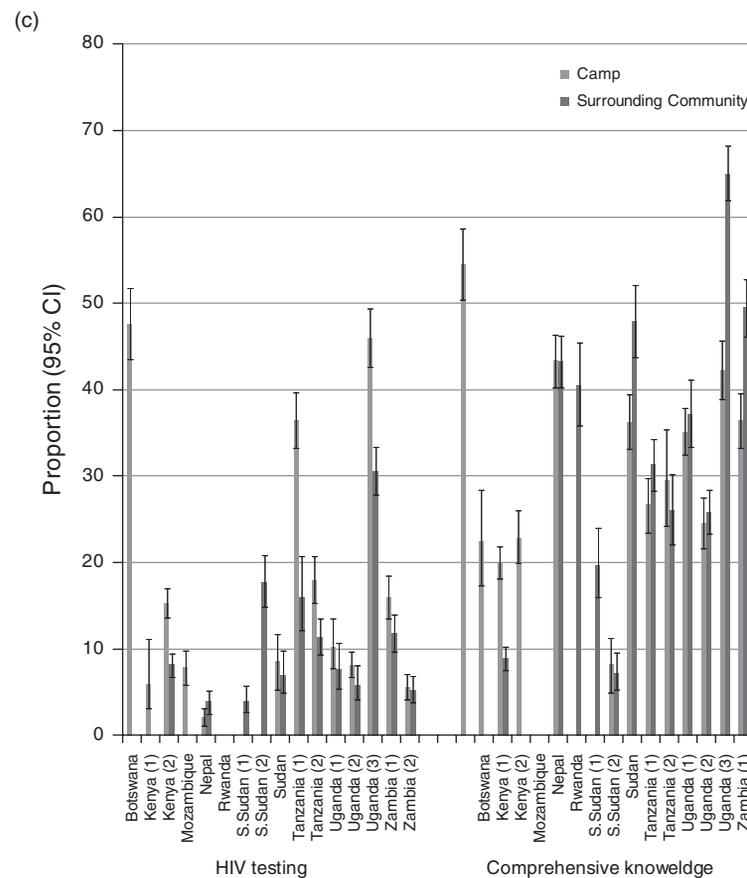


Fig. 1. (Continued).

powerful position to negotiate safe sexual practices with their female partners. This calls for a far more organized and coordinated approach to HIV programming among host governments, UNHCR and its partners, a situation that is unfortunately not currently the norm in many settings.

Given the high variability of the levels of multiple sexual partnerships observed in our study sites, it is important to underscore, as has been done elsewhere [9–13], that sexual behaviour is not only reflective of individual attitudes and characteristics but also influenced by more distal community sexual norms. Indeed, communities that have more permissive attitudes towards multiple partnerships (e.g. polygamy) will also have higher levels of multiple sexual partnerships [10,12,13]. Furthermore, structural drivers that may be specific for refugees and IDPs need to be considered. Some of these may be protective such as continuing norms and attitudes from country of origin in camp-like settings, and others may be negative such as dependency on limited assistance and government restrictions on mobility and right to work.

Other community level traditional sexual practices that increase HIV risk include the acceptability of early and

extramarital sex and the practice of dry sex [14,15]. The effectiveness of HIV prevention would be enhanced through a solid understanding of the prevailing sexual norms and engagement with individuals or groups with high degree of social influence in the community. This in order to develop better targeted HIV interventions that recognize the multiple ways in which underlying structural factors can manifest themselves on risk in different settings [16]. In camp settings where refugees from the same country are housed in proximity, an additional and unique opportunity may exist for understanding varying cultural concepts of sexual behaviour based on which more tailored and nuanced HIV prevention messages could be developed. This in addition to, or perhaps in lieu of, a more generalized one-size-fit-all communication approach.

The factors consistently associated with multiple sexual partnerships in our sample, as has been demonstrated elsewhere [17–19], were male gender and being married. This is in line with findings that the majority of new infections in Africa will likely occur among stable discordant couples [2]. HIV prevention strategies aimed at risk reduction among stable couples should focus on the promotion of women's agency and decision-making power.

**Table 3. Logistic regression for multiple sexual partners in the past 12 months, displacement, mobility, and interaction with neighbouring community after controlling for sociodemographics in refugee camp and surrounding community paired sites.**

	Kenya (2)	Nepal	Rwanda <sup>a</sup>	Sudan	Tanzania (1)	Tanzania (2)	Uganda (1)	Uganda (2)	Uganda (3)	Zambia (1)	Zambia (2)
Refugee	1.29 (0.93–1.80)	NA <sup>b</sup>	NA <sup>b</sup>	NA <sup>b</sup>	0.55 (0.34–0.87)	1.46 (1.13–1.88)	0.39 (0.25–0.60)	0.60 (0.40–0.88)	0.71 (0.53–0.96)	0.89 (0.61–1.30)	1.55 (1.03–2.34)
National (ref)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Age group 25–49	2.00 (1.42–2.80)	0.71 (0.34–1.47)	0.94 (0.41–2.16)	1.71 (0.32–9.16)	1.88 (1.27–2.79)	2.7 (1.49–2.91)	2.09 (1.38–3.18)	1.61 (0.78–3.33)	1.82 (1.10–3.02)	1.04 (0.66–1.65)	0.97 (0.57–1.62)
Age group 15–24 (ref)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Male	2.69 (2.07–3.49)	6.79 (2.98–15.5)	3.61 (2.09–6.21)	3.79 (0.38–38.0)	2.02 (1.42–2.87)	2.01 (1.57–2.57)	2.81 (1.89–4.18)	2.47 (1.81–3.37)	4.16 (3.03–5.72)	5.79 (3.68–9.10)	6.75 (4.18–10.9)
Female (ref.)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Currently married <sup>c</sup>	2.56 (1.94–3.39)	1.22 (0.59–2.54)	5.08 (2.86–9.03)	1.22 (0.23–6.56)	1.88 (0.94–3.77)	2.50 (1.90–3.28)	1.13 (0.73–1.78)	1.69 (1.08–2.67)	1.24 (0.84–1.85)	4.64 (3.02–7.13)	3.32 (2.13–5.19)
Not currently married (ref)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Completed primary school or higher	1.82 (1.39–2.40)	0.89 (0.41–1.94)	0.57 (0.35–0.98)	1.27 (0.23–7.12)	1.15 (0.83–1.61)	1.30 (0.95–1.79)	1.29 (0.90–1.86)	0.84 (0.63–1.3)	1.00 (0.92–1.09)	1.40 (0.66–3.00)	0.91 (0.46–1.80)
None or incomplete primary (ref)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Not employed	0.76 (0.58–1.00)	NA <sup>b</sup>	0.54 (0.24–1.25)	1.21 (0.25–5.87)	0.50 (0.25–1.01)	1.17 (0.89–1.53)	1.51 (0.79–2.87)	2.27 (1.10–4.69)	0.70 (0.48–1.09)	0.74 (0.49–1.11)	0.97 (0.86–1.09)
Employed (ref)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Residing in current community ≤1 year	0.59 (0.36–0.95)	5.87 (1.13–30.47)	0.63 (0.20–1.97)	NA <sup>b</sup>	2.49 (0.82–7.49)	0.92 (0.49–1.72)	1.06 (0.62–1.71)	0.75 (0.37–1.51)	1.75 (1.09–2.80)	3.15 (1.60–6.21)	2.26 (0.63–8.11)
Residing in community > 1 year (ref)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Visits surrounding community ≥1/ month	1.12 (0.85–1.49)	2.33 (1.22–4.46)	NA <sup>d</sup>	2.55 (0.47–13.87)	1.57 (1.06–2.33)	1.44 (1.07–1.94)	1.33 (1.04–1.71)	1.06 (0.75–1.49)	1.01 (0.74–1.38)	1.56 (1.04–2.34)	1.34 (0.86–2.08)
Does not visit surrounding community <1/month (ref)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Away from home >1 month within the 12 months	2.13 (1.66–2.73)	1.34 (0.73–2.44)	1.29 (0.76–2.18)	2.68 (0.96–7.47)	2.13 (1.20–3.77)	2.32 (1.74–3.12)	1.47 (0.90–2.38)	1.22 (0.84–1.75)	1.34 (0.94–1.90)	1.37 (0.91–2.05)	0.98 (0.62–1.55)
Did not travel away (ref)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

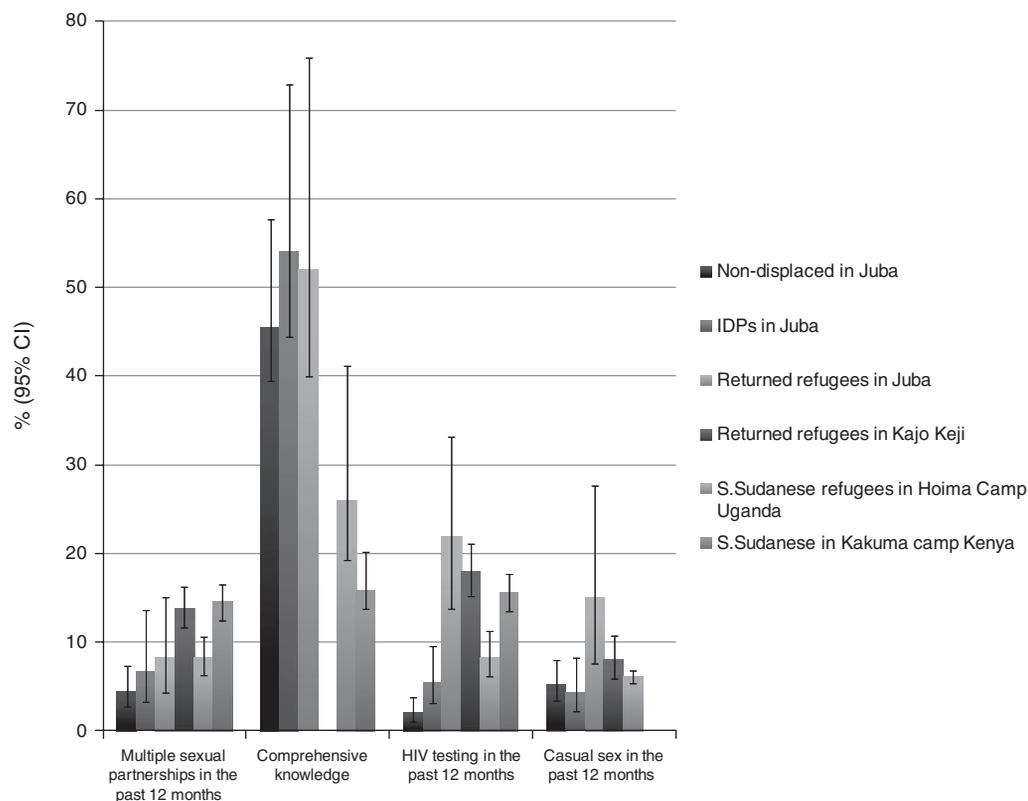
NA, not available.

<sup>a</sup>Data on multiple sexual partnerships only available in the Rwandan surrounding community.

<sup>b</sup>Variable not considered in the model because there were too few multiple partnership observations in this category.

<sup>c</sup>Not married includes never married, divorced or widowed.

<sup>d</sup>Data not collected.



**Fig. 2. Prevalence of HIV testing, multiple and casual sexual partnerships in the past 12 months, as well as comprehensive HIV knowledge among displaced and nondisplaced Sudanese.**

Our data show that refugee women living in stable camps settings were not at increased risk for experiencing forced sex compared to surrounding communities. These findings have important implications for reducing stigma and discrimination against refugees, as it is often incorrectly assumed by host communities that forced sex among nationals increases because of refugee perpetrators. Treatment and support to survivors of forced sex as well as programmes aimed at reducing community level factors that promote intimate partner violence (IPV) need to be readily available in conflict settings and elsewhere. In Nepal especially, a follow-up evaluation, on the baseline high levels of IPV observed and of prevention and treatment programming is warranted.

Owing to the high numbers of sites where South Sudanese were surveyed, we were able to compare important HIV risk factors according to displacement status. The South Sudanese who have never been forcibly displaced reported the lowest levels of multiple sexual partners, casual sex and HIV testing compared with most of the other groups. This is in line with earlier observations that war, particularly long-lasting wars in countries that were isolated, may have been 'protective' for HIV spread for a variety of reasons, and that the

postconflict period was the most critical in terms of enabling disassortative mixing, whereby groups having different levels of HIV risk and infection come together [6,20]. HIV interventions focused on returning refugees in these situations should be prioritized.

Our study was subject to some potential sources of bias. As with all surveys, and especially those dealing with sexual behaviours, we relied on interviewees to report correctly often sensitive and stigmatized activities. Such responses are consequently vulnerable to social desirability and recall biases. Reporting forced sex is subjective and results and interpretation must be undertaken with caution. Recall bias of past events was minimized by asking questions about behaviour and experiences over the past 12 months, whenever appropriate.

### Conclusion

Refugees have long been falsely blamed for spreading HIV among hosting populations. In the largest study of paired sites of refugees in protracted refugee camps/settlements and surrounding populations, the data showed no consistent difference in levels of risky sexual behaviour such as multiple sexual partners, premarital sex and early sexual debut as well as prevalence of HIV testing and comprehensive knowledge among the two populations.

Furthermore, there was a significant amount of variation among the different groups.

Visiting neighbouring communities and travelling for extended periods was associated with high-risk sex in a minority of sites. Given the high prevalence of the short-term mobility, HIV prevention strategies should pay close attention to risk reduction among short-term mobile individuals and their partners. Furthermore, prevention strategies should be targeted in a highly integrated manner for both refugees and surrounding populations than is currently occurring.

Forced sex among women was reported at the same levels among refugees and nationals with IPV being the most common. These findings should help reduce the stigma and discrimination against refugees where it is often incorrectly assumed that forced sex among nationals increases due to refugees.

The persons in South Sudan who had never been forcibly displaced reported the lowest levels of multiple sexual partners, casual sex and HIV testing compared with those who had been forcibly displaced. Such observations reinforce earlier observations that long-lasting wars in isolated countries may have a 'protective' effect against the spread of HIV.

## Acknowledgements

The authors thank the refugees, IDPs and other persons affected by conflict who agreed to take part in these surveys, and also all of the numerous colleagues who participated in these numerous surveys from UNHCR and its partner organizations.

Authors contributions: P.S. conceptualized the manuscript, interpreted the data, contributed to writing the manuscript, agreed with manuscript results and conclusions; M.S. interpreted the data, contributed to writing the manuscript, agreed with manuscript results and conclusions; and M.D. analysed the data, interpreted the data, wrote the first draft of the manuscript, agreed with manuscript results and conclusions.

No grants, equipment, drugs or any combination of these were supported in this work. No funding other than UNHCR, GLIA funds and World Bank funds were used for these BSS.

## Conflicts of interest

There are no conflicts of interest.

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