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Planning STI/HIV Prevention among Refugees and Mobile Populations: Situation Assessment of Sudanese Refugees

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This article reflects an investigation of knowledge, attitudes and behaviours and HIV/STI prevalence of Sudanese refugees and Ethiopian sex workers in 1992. It represents one of the earliest such investigations within an African refugee population. The investigation took place in the Dimma refugee settlement in south-western Ethiopia and study participants included Sudanese refugee men and women and Ethiopian female sex workers. Methods used for this investigation included focus group discussions, behavioural surveys and serologic testing. The main outcome measures of the investigation were HIV/STI knowledge, attitudes and behaviours and biological markers for HIV, syphilis and herpes simplex 2. The study findings indicate that in the early 1990s, knowledge about AIDS and condom use was low among Sudanese refugee women and not one reported having ever used a condom. Furthermore, sexual contact between refugee men and sex workers was frequent during the time of this study and the prevalence of HIV and other STIs was high. The results confirm a widely held assumption that highly mobile and transient populations in Africa are susceptible to STIs and HIV, in large part due to their knowledge, attitudes and behaviours.

Keywords: AIDS/HIV, STI, refugee, antenatal, female sex worker.

Introduction

Human immunodeficiency virus (HIV), the etiologic agent of acquired immune deficiency syndrome (AIDS), has spared no population, including refugees, migrants and other mobile people. Populations in the midst of civil war often experience severe food shortages, forced displacement and overcrowding which all result in elevated rates

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of common communicable illnesses, such as diarrhoea and respiratory infections, leading to increased mortality. While it is appropriate that these acute health concerns have typically been the focus of most emergency public health programmes, the longer term ramifications of war, including the increased risk of transmission for HIV and other sexually transmitted infections (STIs) must also be addressed.

This study was conducted over nine years ago, since then the HIV pandemic has continued to grow, particularly in sub-Saharan Africa, where many of the world's largest refugee populations are found. This investigation thus represents one of the earliest assessments of HIV/STI knowledge, attitudes and behaviours and seroprevalence within a refugee population.

War and population displacement may be a significant and under-recognised collective risk factor for HIV transmission (Khaw et al., 2000). Attracted by the concentration of potential clients with relatively higher incomes, namely relief agency employees, soldiers and, in some instances, refugees, female sex workers (FSW) often relocate to areas near refugee camps. As a result, infection rates of FSWs near refugee camps can equal those found in more urban areas. Sex workers have consistently been identified as populations with increased rates of HIV (Mengistu et al., 1990). For example, in Ethiopia the prevalence of HIV infection among FSWs in Addis Ababa, the capital city, increased from 20 to 54 per cent between 1988 and 1990 (UNAIDS, June 1998); a rapid increase in HIV prevalence was also seen among non-urban FSWs (from 18 per cent in 1988 to 68 per cent in 1991) (Heyeso, 1998). By 1998, HIV prevalence was 73.7 per cent among sex workers in Addis Ababa (Aklilu et al., 2001).

During the late 1980s and early 1990s, a civil war in Sudan caused more than 300,000 people to seek refuge in rural areas of south-western Ethiopia. While typical refugee populations include more women, children and elderly than young men, a unique characteristic of the refugee populations from Sudan in the 1990s was that they were comprised mostly of young boys and adolescents, ranging in age from seven to 18 years; in excess of 37,000 of the refugees were males under 15 years old. Females accounted for only about one-quarter of all refugees and most had come to rejoin their husbands after long periods of separation. Lacking spouses and separated from any family supervision, many male refugees had sexual relations with Ethiopian FSWs who resided near the refugee settlements.

Although recent international HIV/AIDS control efforts have emphasised the special needs of migrants and refugee populations, before 1992 little attention was given to the public health consequences of HIV transmission among refugees and displaced populations and HIV prevention programmes in these settings were uncommon. Refugee protection agencies had expressed concerns that highlighting the risks associated with HIV transmission in refugee populations might lead governments to deny asylum to refugees fleeing countries with high HIV prevalence rates. By the early 1990s, however, there was a growing awareness that many of the largest conflict-affected populations in the world were located in regions with high rates of HIV prevalence (Durban Declaration). In recognition of the potential threat to Sudanese refugees and local populations, in July 1992 an HIV/STI intervention project was initiated as a collaborative effort between the Ethiopian Ministry of Health, the Office of the United Nations High Commissioner for Refugees (UNHCR) and the Centers for Disease Control and Prevention (CDC). Here we present, first, the results of an assessment of knowledge, attitudes, beliefs and behaviours associated with risk of HIV and STI among pregnant and lactating refugee women in a camp in south-western Ethiopia; and second the baseline serologic assessment of STI among women attending antenatal clinics, female sex workers and male refugees in south-western Ethiopia.

Methods

Project setting and participants

All data were collected between June and October 1992 at three project sites in the Keffa region of south-western Ethiopia.

The Dimma refugee settlement was located approximately 30km from the Ethiopia-Sudan border. During 1992 the population fluctuated between 4,000 and 7,000 depending on the level of fighting in Sudan. At least 12 Sudanese ethnic groups were represented in the camp but approximately 90 per cent were Nuer; Dinkas represented the second most prevalent of the refugee groups followed by refugees from Rwanda. The majority of the male refugees had fled Sudan as children along with other male peers and wandered about the border area for months or years, settling for brief periods in different refugee camps. The Dimma refugee camp was selected for this study and intervention because its primarily young male population (unusual in a refugee camp) was perceived to be at high risk. Due to the civil unrest in the area at the time of the study and logistics (for example, camps in south-western Ethiopia were scattered and it was a nearly four-hour drive each way from the regional capital of Amon to Dimma camp), only one site was selected for this study.

Fandinka was a squatter town immediately adjacent to the refugee settlement whose residents consisted of a transient population of gold miners, bar owners and approximately 150–200 female sex workers. The FSWs in the Keffa region were typically highly mobile, residing in any particular town for between two and six months. While many had originally come from distant areas of Keffa region, others came from Addis Ababa and other parts of the country. Some FSWs also reportedly worked as labourers on a nearby coffee plantation.

Amon is a village in Keffa located approximately 120km from Dimma settlement composed predominantly of Ethiopian nationals. Refugees and FSWs could seek medical care from a small clinic in the Dimma settlement which was staffed by a UNHCR nurse and trained community health workers. A hospital based in Amon was staffed by Ethiopian doctors and nurses and treated Ethiopian residents primarily. Residents of Fandinka, which at the time were primarily FSWs and bar owners, could access health services from the Dimma clinic or a town several hours away by vehicle.

Focus group discussions

Focus group discussions were held with four groups of women attending antenatal clinics. Each group was composed of between 6–10 refugee women. While the majority of the women were pregnant or lactating, several non-pregnant or lactating women also participated. Due to the limitations of translation, only those women who spoke the Nuer language were eligible and these included several bilingual Dinka women. Women were selected based upon a convenience sample design. All discussions used a semi-structured interview guide which included questions regarding HIV/AIDS and STI knowledge, attitudes, beliefs, behaviours, access to health-care and contraceptive use. Because of language constraints, all discussions were translated from English to Nuer and were facilitated by a trained female Nuer UNHCR staff member. One of the CDC behavioural research team observed each discussion. All discussions were held in a private room located within the refugee camp.

When analysing results, elaborate discussion notes were taken by the Nuer facilitator as well as the English-speaking observer; all notes were written in English. Key themes were identified and discussed at length between the Nuer facilitator and the researchers. Themes identified in the focus groups influenced questionnaire development for the knowledge, attitude, belief and behaviour survey (KABB).

Knowledge, attitude, belief and behaviour survey

The questions for the KABB survey were developed based on information learned during the open-ended focus group discussions. The KABB survey addressed:

- knowledge and attitudes regarding HIV and STIs of both the refugee women and their husbands;
- behaviours related to the prevention of STIs and HIV, and to contraception including condom use; and
- the women's perceived risk of acquiring an STI or HIV.

In the Dimma refugee settlement pregnant or lactating women were registered with health-care workers so they could receive supplemental nutrition. At the time of the KABB survey 63 pregnant or lactating women were registered and 49 (78 per cent) participated. Only those women who spoke the languages of the Nuer tribe were eligible for study participation. All interviews were conducted in Nuer and translated back into English for data analysis. Interviews were conducted in the hut of each woman between August and October by a trained female Nuer interviewer.

Descriptive statistics, namely frequencies and means, were used to assess the demographic characteristics of the pregnant and lactating refugee women in Dimma. The knowledge, attitudes, beliefs and behaviours regarding HIV and other STIs among this population were also examined using descriptive statistics. The KABB data were entered into EPI Info 6.04 and analysed using SAS 6.12. (SAS Institutes, 1994)

Serologic assessment

The serologic assessment of STI included three populations: female sex workers from Fandinka and Amon; refugee and non-refugee women attending antenatal clinics in Dimma and Amon (ANC women); and male refugees from Dimma.

The specific methods used to enrol participants varied somewhat among the populations. All sex workers in Amon and Fandinka were offered testing and treatment for syphilis through out-reach conducted by local village health workers. Although a precise count of FSWs in these two sites was unavailable, local health officials estimated the total to be at most 300, of which 209 participated in the survey. All women attending antenatal clinics in the project area were encouraged by health-care staff to be serologically evaluated for syphilis. Of the 63 women registered at the ANC in Dimma, 58 (92 per cent) participated in the assessment, along with 36 women who had their appointments during our visit to the ANC clinic in Amon. Because resources did not permit screening of all male refugees for syphilis, a convenience sample of 500 males was identified, from which 250 people were randomly selected; 211 (84 per cent) of those selected participated in the assessment.

All those supplying blood samples provided voluntary verbal consent after being read a statement, translated into the participant's primary language, which informed them of the purpose of the blood test, as well as the potential risks and benefits associated with participation in the project. With the assistance of health clinic staff, each participant answered a brief questionnaire regarding demographics, symptoms suggestive of previous episodes of STI, and — if male — a history of prior sexual contact with sex workers. An individual's questionnaire was linked to their serum specimen with a unique numerical identifier. Any individual with a reactive rapid plasma reagin test (RPR) was offered treatment with intramuscular Benzathine Penicillin G in accordance with the Ethiopian National STI Treatment Guidelines.

RPR testing was performed by the Mizan Regional Hospital in Keffa and the specimens were then forwarded to the Central Laboratory in Addis Ababa for microscopic haemaglutination testing (MHATP) using standard methods. Specimens with a reactive RPR and positive MHATP were considered to have confirmed syphilis infection for this analysis. After all personal identifiers were removed, the specimens were examined for antibodies to HIV-1 and herpes simplex virus 2 (HSV-2) at CDC in Atlanta. HSV-2 serologic testing was performed by a method described elsewhere (Schmid et al., 1999; CDC, 1993 No. 542). Serologic evaluation for HIV-1 infection was conducted using commercially available EIA test kits (Genetics Systems, Seattle); western blots were performed on specimens repeatedly positive by HIV EIA. HIV infection was considered confirmed in specimens with a positive western blot.

Frequencies, means, comparisons of proportions (rate ratios (RR)), and their 95 per cent confidence intervals (95%CI), were calculated using Epi Info version 6.04; 95 per cent confidence intervals for proportions were calculated using the Fleiss quadratic equation. Backward logistic regression analyses were performed using SPSS version 8. All exposures significant in the univariate ($p<0.05$) analyses were included in the initial regression equation.

Results

Focus groups

The responses from four focus group discussions were obtained from 28 pregnant and non-pregnant women. Participants ranged in age from 18 to at least 45; many of the women did not know their exact birth date or age. All 28 women indicated that malaria was their biggest health concern. Other diseases, including diarrhoea, meningitis and diseases acquired from sex, such as 'Kerkker' (chancroid) were also mentioned. The participants stated that people who had many sex partners, such as sex workers and the refugee students, were more likely to get STIs. They also identified sharing household materials — drinking cups, being coughed on and contact with urine — as other possible means of transmitting STIs. Very few of the women had specifically heard of HIV or AIDS. Those who had heard of AIDS had been informed since their arrival in the Dimma settlement camp, primarily while attending clinics in the hospital.

Several women responded that they were not at risk of STIs because their husbands would not use sex workers since they were in the camp. Other women admitted that even if they knew that their husband had an STI, they could not refuse to have sex with him. The women reported that they had little means of protecting

themselves since they were expected to be submissive to their husbands. The women reported that in Sudan relatives arranged most marriages and that women tended to be married by 14 or 15 years of age. However, because of their refugee status, some of the women had not gotten married until they were in their early 20s. Nevertheless, most women have had sexual intercourse by the time they are 15 years of age, even if they were not yet married.

KABB survey

Demographic characteristics of the KABB survey participants and their responses are presented in Tables 1 and 2. The majority of the women lived with their husbands and had two or three living children. All women reported that they had heard of diseases transmitted by sex and 73 per cent reported that they had heard of HIV or AIDS, which was referred to as 'international'. However, most women (69 per cent) reported that they did not know how HIV/AIDS was transmitted. The majority (81 per cent) said that they had heard about AIDS from their friends.

No refugee woman reported ever having used a condom. At the same time, 19 (39 per cent) had heard of condoms but did not know the reason for their use. In response to questions asked to understand better why either the woman or their partners had not used condoms, 18 (37 per cent) replied that they felt their husbands would

Table 1 Selected demographic characteristics of Sudanese refugee women attending antenatal clinics in the Dimma refugee settlement, Keffa region, Ethiopia (N=49)

Characteristic	*Number of women*	*%*
Age (years)		
<20	8	16
21–30	19	39
31+	22	45
Marital status		
Married, lives with husband	27	55
Married, does not live with husband	5	10
Divorced/widowed	7	14
Single, never married	7	14
Other	3	6
Education level		
None	32	65
1–4 years	12	25
4–8 years	5	10
8+ years	0	0
Number of living children		
0	12	24
1	4	8
2–3	26	54
4+	7	14

Table 2 Knowledge, attitudes, beliefs and behaviours regarding HIV and STI among antenatal Sudanese refugee women (N=49)

Question	*Number of women with affirmative response (%)*	
Ever heard of diseases transmitted by sex?	49	(100)
Ever heard of HIV or AIDS?	37	(76)
How did you hear about HIV or AIDS?*		
Radio	11	(30)
Magazine	4	(11)
Friends	30	(81)
TV	0	(0)
Don't Know	5	(13)
How is AIDS transmitted?*		
Unsterile or dirty needles	2	(5)
Sex with infected person	3	(8)
Shaking hands with infected person	4	(11)
Don't know	22	(69)
A person who looks healthy can have an STD or AIDS?	25	(68)
You can be infected with AIDS from a person who looks healthy ?	29	(78)
What are condoms used for?*		
Contraception	2	(4)
Protection from STIs	11	(22)
Protection from HIV/AIDS	17	(35)
Don't know	19	(39)
Have you ever used a condom?	0	(0)
Would your partner use a condom for birth control?	9	(18)
Would your partner would use a condom for STI or AIDS prevention?	18	(37)
Why do you think your partner might not want to use condoms?*		
Contrary to his religion or culture	3	(6)
Partner does not know how to use them	6	(11)
Don't know	35	(71)
Women should use condoms to protect themselves from HIV	25	(51)

*Responses are not mutually exclusive; total may exceed 49.

agree to use a condom as protection from STIs or AIDS. Six women indicated that their husbands would reject condoms because they did not know how to use them and three claimed that religious beliefs would inhibit their husbands' use of condoms.

Serologic survey

The number and demographics of the participants in the serologic survey are presented in Table 3. Of note is the generally young age of the population, particularly the sex

workers. All of the sex workers identified themselves as Ethiopian and a majority of those participating in the survey lived in Fandinka. Most of the participating male refugees were Sudanese and nearly two-thirds were unmarried. Among antenatal clinic attendees in the refugee settlement almost all (58 or 59) were Sudanese, while all those receiving ANC care in Amon were Ethiopian. Most of the refugees and about half of the sex workers had been in the Keffa region for a short time (six months or less).

The participants' responses to questions regarding prior symptoms of sexually transmitted infections, contact with sex workers and serologic test results for HIV, HSV-2 and syphilis are shown in Table 4. Approximately one-third of male refugees and sex workers reported having experienced either genital ulcers, genital discharge or inguinal swelling at some point in the past, with discharge being the most common complaint. A lower proportion of women attending antenatal clinics reported a history of these symptoms.

Table 3 Selected demographic characteristics of antenatal clinic (ANC) attendees, male refugees, and female sex workers

Characteristic	*Male refugees*		*Sex workers*		*ANC attendees*	
Number of participants	211		209		94	
Age in years						
Median age	20		19		24	
Age range	15–50		15–35		16–36	
	Number and % of all respondents					
Nationality						
Ethiopian	2	1%	209	100%	36	38%
Sudanese	181	86%	0		58	62%
Other	28	13%	0		0	
Time in region						
6 months or less	139	77%	69	47%	53	78%
More than 6 months	42	23%	78	53%	15	22%
Marital status						
Married	73	36%	3	1%	87	96%
Never married	131	64%	119	59%	3	3%
Divorced/separated	1	0%	81	40%	1	1%
Residence						
Dimma	211	100%	0		59	63%
Fandinka	0		123	59%	0	
Amon	0		86	41%	35	37%

Table 4 History of STIs, serologic test results and risk behaviours of refugees and sex workers

	Male refugees				*Sex workers*				*Antenatal clinic*			
Characteristic	*No. of resps*	*No. affirm/ pos*	*%*	*95% CI*	*No. of resps*	*No. affirm/ pos*	*%*	*95% CI*	*No. of resps*	*No. affirm/ pos*	*%*	*95% CI*
History of STIs												
Genital ulcer	196	43	22	(16–29)	205	14	7	(4–11)	94	6	6	(3–14)
Genital discharge	203	51	25	(19–32)	207	45	22	(16–28)	94	6	6	(3–14)
Inguinal swelling	200	26	13	(9–19)	202	26	13	(9–18)	94	3	3	(1–10)
Any one or more of the above	205	78	38	(31–45)	208	64	31	(25–38)	94	10	11	(5–19)
Serologic test results												
Herpes simplex 2	211	3	27	(22–34)	203	132	65	(58–71)	85	22	26	(17–37)
Syphilis serology	199	51	26	(20–32)	190	27	14	(10–20)	83	9	11	(5–20)
HIV infection	211	10	5	(2–9)	209	83	40	(33–47)	94	2	2	(0–8)
Risk behaviours (males only)												
Has had sex with sex worker	207	95	46	(39–53)								
Has had sex with sex worker in last three months	206	64	31	(25–38)								

Almost one-half of male refugees reported having had intercourse with a sex worker at some point in the past and nearly one-third of the male respondents reported at least one sexual contact with a sex worker in the previous three months. Men between 15 and 19 years of age were more likely than older men to report sexual contact with an FSW in the previous three months but the difference was not statistically significant.

About one-quarter of all refugee men and women attending antenatal clinics had a positive serologic test indicating prior HSV-2 infection; this figure increased to 65 per cent among the sex workers. The highest rates of reactive syphilis serologies (26 per cent) were found among male refugees. The rates among FSWs and antenatal women, although lower at 14 and 11 per cent, respectively, were not significantly different.

HIV infection was confirmed in 40 per cent of the sex workers. By comparison, relatively low rates of HIV infection were identified among the male refugees and antenatal clinic attendees, 5 and 2 per cent, respectively. An additional 15 individuals (seven refugee males, seven sex workers and one antenatal clinic attendee) were repeatedly positive by HIV EIA but had indeterminate results by western blot testing. They were counted as HIV negative in the figures in Table 2 and excluded from the analyses of factors associated with HIV infection presented below.

For each population group, univariate analyses were conducted to identify possible risk factors for HIV infection. Variables analysed included, age, marital status, length of time residing the Keffa region, history of prior sexually transmitted infections and serologic evidence of HSV-2 infection.

Among sex workers, several factors were found to be significantly associated with HIV infection. A total of 62 (48 per cent) of 128 FSWs with serologic evidence of HSV-2 infection were infected with HIV compared to 18 (27 per cent) of 67 FSWs without HSV-2 infection (RR 1.8, 95%CI 1.2–2.8; $p<0.005$). A history of symptoms consistent with previous STIs was also associated with HIV infection; 33 (53 per cent) of 62 FSWs with a history of vaginal discharge, genital ulcers, and/or inguinal swelling were HIV infected compared to 49 (36 per cent) of 136 without such a history (RR 1.5, 95%CI 1.1–2.0; $p<0.05$). The strength of this association increased slightly (RR 1.9, 95%CI 1.4–2.5; $p<0.005$) when history of vaginal discharge was considered alone.

For male refugees, a positive history of symptoms suggesting a sexually transmitted infection in the past was strongly associated with HIV infection; eight (10 per cent) of 77 males with a history of penile discharge, genital ulcers, and/or inguinal swelling were HIV infected, compared to one (1 per cent) of 121 without such a history (RR 12.6, 95%CI 1.6–98.6; $p<0.005$). The association between HIV and history of a STI remained statistically significant when the analysis was conducted to examine a history of discharge or ulcer separately (RR 5.8 and 5.7, respectively; $p<0.05$).

Contact with a sex worker was not significantly associated with positive HIV serology among refugee males ($p=0.19$). Contact with an FSW was, however, strongly associated with a history of symptoms consistent with STI. A total of 57 (62 per cent) of 92 men who reported ever having sex with an FSW had a history of penile discharge, genital ulcers and/or inguinal swelling, compared to 20 (18 per cent) of 110 men who denied ever having contact with an FSW (RR 3.4, 95%CI 2.2–5.2; $p<0.000005$). The association between contact with an FSW and history of STI remained significant when the analysis was conducted to examine a history of discharge, ulcer or inguinal swelling separately and when the definition of contact with an FSW was restricted to an episode occurring in the three months prior to the survey.

Among women attending antenatal clinics none of the factors examined was found to be significantly associated with HIV infection (n=2).

In logistic regression analyses, both a history of vaginal discharge (OR 3.4, 95%CI 1.6–7.2; $p<0.005$) and HSV-2 infection (OR 2.8, 95%CI 1.4–5.5; $p<0.005$) were significant independent predictors of positive HIV serology among sex workers. Regression analyses were not performed for male refugees or ANC attendees because of the relatively small number of HIV infections identified in these groups.

Discussion

This study provides the first available data on HIV/STI prevalence within a Sudanese refugee population and a local population of FSWs and ANC women in Ethiopia, as well as levels of knowledge, attitudes and behaviours with regard to AIDS and STIs among Sudanese refugee women. The prevalence of STIs and knowledge, attitudes and behaviours about AIDS among the populations reported here may have changed since 1992, and most of the refugees have returned to Sudan. However, this investigation serves as one of the earliest assessments of HIV/STI KABB and prevalence among refugee and transient populations in Africa. The behavioural assessment among refugee women identified several important issues that must be addressed in attempting to design effective HIV/STI prevention measures for this population. First, although many refugee women reported that they knew of sexually transmitted infections and — according to the KABB survey — many reported that they had heard of AIDS, most did not know that it was transmitted by sexual contact. Second, only one-third of the KABB respondents acknowledged that condoms could be used to prevent AIDS and less than one-quarter were able to identify condom use as protective against other STIs. Third, less than one-half of the KABB participants indicated that they felt that their partner would use a condom to prevent transmission of AIDS or STIs. However, at the time of the study, none of the refugee women had ever used a condom and those that did respond favourably about condoms may have done so to please the interviewer. In the focus group discussions, it was not surprising to hear that these women often have limited power to negotiate sex with their partner, including the use of any form of prevention against STI/HIV infection and pregnancy, even if they suspect that their partner has an STI.

Given the amount of education about AIDS dispersed throughout Africa over the past decade, we expect that since 1992, knowledge about AIDS risk factors has probably increased among Sudanese women and Ethiopian sex workers. However, for those women who still live highly transient and impoverished lives and who do not have access to radios or other means of education, as is the case for many refugee women, knowledge about AIDS may still be low and not a high priority given all their other day-to-day struggles.

The serologic assessment also provided information critical for developing an HIV programme for this refugee population which was characterised by its unusually large proportion of young males and high level of contact with sex workers. Many of the males had fled Sudan as boys, escaping the war and capture from the enemy army, and had lived for years in small groups throughout Kenya, Ethiopia and Sudan without parental supervision or support. Contact with sex workers by refugee males was common, and often from a young age. HSV-2 seroprevalence rates exceeded 25 per cent for all groups studied thus indicating that many were at risk of STI, and potentially

HIV-1 infection. Prior symptoms of STI were also very commonly reported among the refugee males and FSWs.

The seroprevalence of syphilis among pregnant women in this study (11 per cent) compares with 9 per cent among women studied at antenatal clinics in Addis Ababa (Mehret, 1996). The highest rate of positive syphilis serology was observed among refugee males; it is possible, however, that this represents high rates of endemic syphilis, not venereal syphilis, since the serologic tests used in this study would be positive for either condition and there is evidence of persistent foci of endemic treponematoses in Sudan and Ethiopia (Mohamed, 1985; Meheus and Antal, 1992).

The HIV seroprevalence of 40 per cent among sex workers is high by any standard and demonstrates how widely the HIV-1 epidemic had spread in Ethiopia by 1992. As the data in this study indicate, nearly 50 per cent of the FSWs recently came to the Dimma camp from the capital of Addis Ababa, where HIV infection was already high among sex workers. Although the HIV prevalence was lower among male refugees (5 per cent), this level is high by global standards and indicates that preventing HIV-1 and other STIs was already a major public health imperative. It is worth noting that an additional seven refugee males had repeatedly reactive HIV-1 EIA tests but indeterminate western blots. In the setting of recent contact with FSWs that have a high rate of HIV-1 infection, it seems likely that some of these indeterminate results among the refugee males represent recent HIV-1 infection (thus, seroconversion in progress) and thus missed opportunities for prevention. Among sex workers we also found a strong association between HIV-1 infection and HSV-2 seropositivity or a history of a vaginal discharge. These associations have been subsequently observed elsewhere and provide further evidence of the important role of STI case management in the control of HIV/AIDS transmission (Rugpao et al., 1998; Ayisi et al., 2000).

Working in complex emergencies often necessitates some compromise and our project is no exception. General political instability in Ethiopia and armed conflicts between specific ethnic groups in the Keffa region during June–August 1992 limited the amount of time the project team spent working on-site in Dimma.

There are some important limitations of this study which should be noted. First, we experienced challenges in obtaining mutually exclusive groups for the focus group discussions and the KABB assessment. Because we felt information discussed in the groups might influence subsequent responses to the KABB survey, we had attempted to prevent women who participated in them from participating in the KABB survey. The extent to which we were successful is not precisely known and any overlap could have altered the survey responses. Furthermore, because only pregnant and lactating Neur women participated in the focus groups, the findings can only be generalised to this population of refugee women. While an effort was made by the authors and their assistants in the camp to include all pregnant and lactating women in the survey, due to the highly transient refugee population at the time of this investigation, it was not feasible to confirm what per cent of pregnant and lactating refugee women in the camp were actually enrolled in the camp antenatal clinic.

A second limitation was the difficulty experienced in attempting to ensure that we obtained representative samples for the serologic assessment. Because sex workers in the project area were believed to be at substantial risk of syphilis infection and because we wanted to identify and prevent any potential cases of congenital syphilis among ANC attendees, serologic testing was offered to all women in these groups. Without enumerating the denominator for ANC attendees in Amon or sex workers in Fandinka or Amon we were unable to calculate a precise response rate or examine the

data for potential response bias among these two groups. While were we told that no transient refugee women were sex workers, and all sex workers spoke English or Amhara rather than a Sudanese dialect, it is possible, though unlikely, that transient refugee women could have been enumerated as Ethiopian sex workers. Anecdotally, we were informed that serologic testing for syphilis, coupled with the potential for treatment, was seen as a major benefit to these groups and participation was therefore high. In fact, when we employed a sampling scheme among the refugee males, we discovered that many men were very disappointed when they were not offered testing. Future work should address developing efficient and acceptable STI/HIV sampling techniques for mobile populations.

Third, although all interviews were administered by local staff who spoke the participant's language, the mere presence of the foreign research team in the camp may have influenced the responses by the refugees.

This study documents the enormous potential for HIV transmission among a mobile population and host-country contacts and clearly demonstrates the need to incorporate HIV and STI prevention and care activities into the routine public health programmes provided by relief organisations to refugees and internally displaced populations. Development of culturally relevant and effective methods and materials to promote HIV prevention strategies, such as the use of condoms, requires the kind of situation assessment we have described. Such studies are not appropriate during the early phase of a conflict-related emergency when the major priorities are the provision of adequate food, shelter, clean water, sanitation and the control of common and lethal conditions such as measles, diarrhoea, malaria and meningitis. Thus, UNAIDS, WHO and UNHCR have recommended a minimal essential package of STI/HIV services during the early stages of an emergency (namely, the destabilising event, such as a conflict or a population migration and the loss of essential services). This package comprises: ensuring a safe blood supply; implementing universal precautions to prevent transmission in the medical setting; provision of an adequate supply of condoms; and the provision of basic information on HIV transmission (WHO and AIDS, 1998).

In the later stages of an emergency, relief organisations should consider implementing the following approaches:

- conduct a situation analysis, such as the studies described in this paper;
- establish baseline data;
- undertake formative research;
- design a KABB survey;
- assess existing infrastructure;
- identify a HIV/AIDS/STI programme coordinator;
- develop materials for information, education and communication of prevention messages;
- establish a regular programme for condom supply;
- develop a programme of syndromic management of prevalent STIs; and
- establish voluntary counselling and testing services and clinical care for those infected with HIV.

The findings from our study suggest that interventions which focus only on one target population will not be adequate to reduce the incidence of HIV infections in a

particular region. Instead, interventions should be designed that take into consideration the relationship between refugee women, refugee men and sex workers. For example, it will be of no practical use to give sex workers condoms unless their male clients are educated to use them. Similarly, refugee men who have engaged in extramarital sex must be willing to use condoms with their wives. Clearly, a major obstacle to HIV/STI prevention within refugee populations as well as most other communities touched by the HIV epidemic is that the only HIV prevention methods available are condoms, abstention and monogamy, which may not be realistic for many women who rely on men for economic support. The behavioural findings indicated that some refugee women knew that their husbands had sex with FSWs and had STIs; however, the refugee women felt powerless to protect themselves or their children from potential disease, largely due to their status in society. Similarly, in order for FSWs to use condoms regularly, their clients, including refugee men, must *want* to use them.

Currently, the use of condoms, which is the main form of barrier protection against HIV/STIs available to the population, relies on male cooperation. The female condom has been introduced in some parts of the world as an alternative to the male-controlled condom. It puts more control in the hands of the woman. While several female condom interventions have been shown to be successful, the female condom still requires male cooperation, is awkward for the user and is often too expensive. Condoms are an effective method for HIV/STI prevention but clearly they alone are not a sufficient HIV/STI intervention for many populations. There is an urgent need to develop effective HIV/STI prevention methods that are controlled by women, such as microbicides, which are affordable, easily accessible and effective against HIV and other sexually transmitted infections (Alliance for Microbicide Development, 1998; Van Dam, 2000).

There have been few published studies of knowledge and behaviours regarding HIV or the prevalence of HIV and other STIs in refugee populations, particularly those in the Horn of Africa. Such information is critical for the development and implementation of effective interventions that address the particular needs of refugee and other mobile populations.

While this study was conducted a decade ago, the HIV pandemic has continued to grow, particularly in sub-Saharan Africa, where many of the world's largest refugee populations are found. Our experience conducting a rigorous situation assessment of STI prevalence, STI risk factors and knowledge, attitudes and behaviours related to HIV and STI transmission informed the design of a culturally relevant and context-specific prevention education programme that used traditional methods of communicating key messages. We strongly believe that such an approach should be a routine element of a refugee assistance programme once the immediate public health priorities have been addressed.

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