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Changes in HIV/AIDS/STI Knowledge, Attitudes and Practices among Commercial Sex Workers and Military Forces in Port Loko, Sierra Leone

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Sierra Leone suffered from 11 years of civil war (1991–2002) resulting in tens of thousands of deaths and mutilations together with massive population displacement. In 2001, ARC International, Sierra Leone conducted a baseline survey of 201 commercial sex workers (CSWs) and 202 military respondents on the knowledge, attitudes and practices surrounding HIV/AIDS and STIs in Port Loko, Sierra Leone. In 2003, a comparable post-intervention survey of 202 CSWs and 205 military respondents was performed. Comparison of baseline and post-intervention results showed that HIV/AIDS knowledge increased among both groups, with those able to name three effective means of avoiding AIDS increasing from 5 per cent to 70 per cent among CSWs, and 11 to 75 per cent among the military. Reported condom use during last sex increased among CSWs from 38 to 68 per cent and among military from 39 to 68 per cent. These results demonstrate that, despite the challenges inherent in a post-conflict country, good-quality AIDS-prevention programmes can be effective.

Keywords: AIDS, STI, military, commercial sex workers, Port Loko, Sierra Leone, post-conflict.

Introduction

In December 2000, the American Refugee Committee International, Sierra Leone (ARC) launched an HIV/AIDS and sexually transmitted infection (STI) prevention project in Port Loko, Sierra Leone. Given the influx of military personnel and an apparent increase in commercial sex activity in and around Port Loko, ARC identified commercial sex workers (CSWs) and military personnel as two primary target populations for AIDS-prevention efforts. As part of its monitoring and evaluation

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activities and in order to guide improvement of the project's intensive community outreach and education activities, the ARC Health Team[1] conducted baseline and post-intervention surveys in March 2001 and June 2003, respectively. These surveys measured the HIV/AIDS and STI knowledge, attitudes and practices (KAP) of their targeted populations in Port Loko.

Background

Eleven years of conflict in Sierra Leone (1991–2002) devastated the country, resulting in more than 50,000 deaths, widespread human rights abuses and massive population displacement (US Committee for Refugees, 2003). The rebel Revolutionary United Front (RUF) routinely abducted children for forced labour in the rebel armies, carried out summary executions of civilians, amputated limbs and perpetrated sexual violence against women (Human Rights Watch, 2002). As a result, it is estimated that up to one-half of Sierra Leone's 4.5 million citizens were forced to flee their homes, either to government-held safe areas within the country or as refugees in the neighbouring countries of Guinea, Liberia, Ghana, Gambia and Nigeria (USCR, 2003; CIA, 2003). Additionally, destruction of public and private property was rampant during the conflict with more than 300,000 homes and 80 per cent of schools and health clinics destroyed or seriously damaged (USCR, 2003). By 2001, only 38 per cent of the country's Peripheral Health Units and 70 per cent of district hospitals were functioning (WHO, 2001). Sierra Leone consistently ranks as one of the most poverty-stricken nations in the world with one of the highest under-five child mortality rates (284 per 1,000), a life expectancy of only 34 years and over one-third of the population lacking access to safe drinking water or adequate sanitation (Unicef, 2003).

Port Loko, in the Northern Province of Sierra Leone, is a strategically important town located along the sole land route between the capital city of Freetown and Lungi International Airport. During the war, Port Loko changed hands several times. The Sierra Leonean government prioritised holding the town and stationed a large number of Republic of Sierra Leone Armed Forces (RSLAF) there. UN peacekeepers were also stationed in Port Loko (Global IDP Project, 2003). Despite the July 1999 signing of the Lomé peace agreement, violence by the RUF increased, causing further internal displacement as Sierra Leoneans fled to government-held safe areas like Port Loko (Global IDP Project, 2003). By the end of 2000, an internally displaced persons (IDP) camp on the outskirts of Port Loko housed approximately 20,000 Sierra Leoneans, while 60,000 additional IDPs found shelter with local residents in and around Port Loko town (USCR, 2001). Additionally, as part of the peace process Port Loko hosted thousands of ex-combatants in a Disarmament, Demobilisation and Reintegration camp, where the RUF and Civil Defence Forces (CDF)[2] disarmed and attempted to reintegrate them into civilian life.

HIV/AIDS in Sierra Leone

Until recently, no reliable data existed on HIV/AIDS prevalence in Sierra Leone. However, in April 2002 a national sero-prevalence survey was conducted by the US Centers for Disease Control and Prevention (CDC). Although initial results indicated a 4.9 per cent prevalence rate, further testing revealed a low national HIV-prevalence rate of 0.9 per cent (Kaiser et al., 2002). Yet, evidence suggests that conditions in Sierra

Leone are ideal for a potentially dramatic spread of HIV (Khaw et al., 2000). Risk factors include massive population displacement (USCR, 2003); destruction of the health infrastructure (Global IDP Project, 2003); high prevalence of war-related sexual violence including rape as a terror tactic and abduction of women into sexual slavery (Amowitz et al., 2002; Save the Children, 2002); peacekeeping troops from countries with high HIV prevalence (GAO, 2001; WHO, 2000); increased commercial sexual activity (Global IDP Project, 2003; WHO, 2000); and widespread poverty and illiteracy (Unicef, 2003).

A number of small studies have revealed HIV-prevalence rates higher than the official CDC figure among certain subgroups in Sierra Leone. In the capital Freetown, sero-prevalence rates in the late 1980s and early 1990s were noted to be at 27.5 per cent among CSWs, 7.1 per cent among blood donors and 4.5 per cent among patients with STIs (Richter et al., 2001; Kosia, Kargbo and Makiu, 1989; Kosia, Kargbo and Thorlie, 1989; Makiu et al., 1992). Fewer than 10 years later, Sierra Leone's Ministry of Health and Sanitation found a prevalence rate of 70.6 per cent among CSWs in Freetown (WHO, 2000). In 1997, women attending antenatal sites in three cities in Sierra Leone were found to have an HIV-prevalence rate of 7 per cent (WHO, 2000). In 1999, the RSLAF tested 1,009 male civilians applying for military status and found a 21.3 per cent sero-prevalence, an increase from 7.8 per cent five years earlier when 1,723 were tested for HIV prevalence (WHO, 2000). Although these studies are small and may have limited statistical validity, they do paint a more complex picture of HIV/AIDS in Sierra Leone than the official rate may suggest. The dramatic discrepancy between these estimates and the CDC prevalence figure suggest that additional work is required to determine accurately the HIV-prevalence rates in various sub-populations in Sierra Leone.

Military forces and commercial sex workers

Conflict settings often stimulate an increase in transactional sexual activity. Military personnel, especially those on peacekeeping missions, often have more disposable income than do the surrounding populations and thus have the financial means to purchase sex (UNAIDS, May 1998). Peacekeepers have been posted in Sierra Leone since the early 1990s. Between 1990 and 1998, approximately 12,000 troops were deployed to Sierra Leone from the Economic Community of West African States Monitoring Group (ECOMOG), a non-standing military force overseeing security concerns in West Africa (Kaiser et al., 2002). In 1999, the UN Mission in Sierra Leone (UNAMSIL) took over peacekeeping efforts from ECOMOG, hosting one of the largest UN peacekeeping contingents in history, with an authorised strength of up to 17,500 military personnel from more than 30 countries (UN DPKO, 2004). This is a potentially dangerous situation for the spread of HIV/AIDS and STIs, as it is estimated that in peacetime, infection rates among military forces are typically two to five times greater than rates found in civilian populations (UNAIDS, May 1998). In times of conflict, the military may have infection rates up to 50 times higher (UNAIDS, May 1998). Further, STI infection rates tend to be higher among military units stationed away from home (Foreman, 2002). In sub-Saharan Africa, some ministries of defence estimate HIV-prevalence rates of 20 per cent to 40 per cent within their armed services and up to 50 per cent to 60 per cent in the militaries of those countries with mature epidemics (Yeager, n.d.). One retrospective analysis of blood donors in the Manica Province of Mozambique revealed a 39.1 per cent HIV-prevalence rate among military

donors as compared to 15.3 per cent among civilian donors (Newman et al., 2001). It is also estimated that the Nigerian military, the largest African contributor to the UN peacekeeping forces, has an HIV infection rate of 10 to 20 per cent, as compared to 5 per cent in Nigeria's general population (GAO, 2001).

Several factors are thought to contribute to this elevated infection rate among the military. The leading factor appears to be posting military personnel far from home for extended periods of time. For example, it has been reported that some Nigerian peacekeepers in West Africa were deployed for two to three years without home leave, although it is generally accepted military protocol to limit deployment away from home to maximum six-month tours of duty (Carballo, 2001). Removed from the traditional social controls of family and community, military personnel often seek respite from stress, loneliness and sexual tension through high-risk activities (UNAIDS, May 1998). Additionally, military environments frequently perpetuate a risk-taking culture. Thus, military personnel may transfer their risk-taking ethos from the battlefield into their sexual behaviour, engaging in such activities as sex without a condom or commercial sex (UNAIDS, May 1998; Foreman, 2002). For example, approximately 45 per cent of Dutch peacekeepers in Cambodia reported engaging in sexual activities with CSWs or other members of the local population over a five-month deployment in 1993, and 11 per cent stated they did not always use a condom (GAO, 2001; UNAIDS, May 1998). Another study indicated that approximately 30 per cent of US sailors in South America reported engaging in sexual activity while deployed, and 15 per cent said they did not always use condoms (GAO, 2001; UNAIDS, May 1998).

Like military forces, commercial sex workers have long been associated with increased risk for the transmission of HIV and STIs. In West Africa, studies have found HIV-prevalence rates among CSWs to range from under 20 per cent in Dakar, Senegal to more than 70 per cent in Accra, Ghana and Lomé, Togo (Lydié et al., 1998). A study of sex workers in Addis Ababa, Ethiopia revealed an HIV-prevalence rate of 73.7 per cent (Aklilu et al., 2001). Rates of other STIs among CSWs are similarly high. Among female CSWs in Burkina Faso, it was found that 52.6 per cent were infected with one or more STIs (Lankoandé et al., 1998). Researchers in Cotonou, Benin found 43.2 per cent of CSWs infected with gonorrhea, 9.4 per cent with chlamydia, and 8.9 per cent with syphilis (Alary et al., 2002).

High numbers of sexual partners and low consistent condom use elevate CSWs' risk of infection. In West Africa, CSWs appear to average three sexual clients per day, though a small percentage report up to 10 clients per day (Lydié et al., 1998). Only 40 per cent of CSWs in Addis Ababa reported using condoms with more than 95 per cent of their clients (Aklilu et al., 2001). In Benin City, Nigeria, only 37.5 per cent of CSWs reported using condoms regularly (Asowa-Omorodion, 2000). Evidence also reveals that some CSWs will forgo the use of condoms with clients willing to pay a higher price (Lydié et al., 1998).

In conflict situations like Sierra Leone in which families are broken apart, female-headed households are common (Khaw et al., 2000; UNAIDS et al., 1995). With limited opportunities available to them and low education, these women are often economically vulnerable (Khaw et al., 2000). Evidence suggests that sex is seen as the 'currency' with which displaced women are expected to 'pay' for the things they need, including food, access to education for their children and even passage across a border (UNHCR News Stories, 2001). Thus, sex is widely traded as a commodity in West African refugee camps in order to obtain the essential items for survival (Save the Children, 2002; Khaw et al., 2000). Thirty-two per cent of peacekeepers stationed in Sierra Leone came there from nations with HIV-prevalence rates of over 5 per cent,

including Nigeria, Kenya and Zambia (GAO, 2001; Kaiser et al., 2002), making transactional sex especially dangerous considering that peacekeepers are identified as the primary clients of CSWs (Bazergan, 2002). With few alternatives, women who exchange sex for money or goods as a survival strategy have very little power in negotiating the use of a condom, placing them at increased risk of HIV and STI infection.

In Sierra Leone, the combination of military forces with expendable incomes and the poverty and powerlessness of local women, appears to have increased the frequency of sex as a means of survival, setting the stage for a worsening HIV/AIDS situation in the country.

Methods

Survey sample

Identical purposive quota-sampling techniques were used to select CSW and military respondents residing in Port Loko for the baseline and post-intervention surveys. This technique was employed because the focus on specific study groups precluded a community-based random sampling technique, and a reliable sampling frame from which to select a random sample of the targeted groups was not obtainable at the time. The respondents at baseline and post-intervention were selected in as similar a manner as possible. However, no attempt was made to re-contact respondents from the baseline survey, as the survey was anonymous and a high turnover among CSW and military populations made this unrealistic. It is important to be aware that this technique estimates group-level changes, and not specific changes at the individual level.

Aiming for a quota of 200 female CSWs between the ages of 15 and 49 for each survey, 201 CSW respondents were interviewed for the baseline survey and 202 CSW respondents were interviewed for the post-intervention survey. For military respondents, quotas of 100 UNAMSIL and 100 CDF/RSLAF males between the ages of 15 and 49 were used. At baseline, 102 UNAMSIL and 100 CDF/RSLAF respondents were interviewed for a total of 202 military respondents. At the time of the post-intervention survey, the CDF had disbanded, and therefore were not included in the quota. Military respondents at post-intervention consisted of 108 UNAMSIL and 97 RSLAF for a total of 205 military respondents. Male and female young people were also surveyed at baseline and post-intervention, but these results are discussed elsewhere (ARC International, Sierra Leone, 2003).

To select respondents, individuals who appeared to the interviewer to fit a particular quota category (e.g., a man in military uniform who appeared to be between 15 and 49 years old) were approached and asked if they would participate in a short interview about health. If they agreed, respondents were asked their age and occupation or status to determine if they fit the quota category. Potential respondents for the CSW category were identified based upon where they gathered (i.e., known commercial sex centres of activity), style of dress and hair and activity during the day (i.e., not otherwise employed).

It should be noted that, because of the sampling technique used, the respondents do not make up a representative sample of the population of Port Loko or

of their particular quota category. However, the sampling plan ensured that respondents were selected from all military installations and all known centres of commercial sex activity. Very few individuals approached for an interview refused to participate, further limiting potential bias. Nevertheless, it is likely that individuals with particular characteristics were systematically under-represented, such as those who spent most of their time at home, perhaps due to ill health.

Questionnaire

The ARC Health Team created, pre-tested and revised a survey instrument consisting of 19 multi-part questions.[3] The instrument was written in English and included the following constructs: socio-demographic characteristics, knowledge of HIV/AIDS and STIs, attitudes towards HIV/AIDS and STIs, condom-use behaviour and health-seeking behaviour. The post-intervention survey instrument included two additional multi-part questions regarding awareness of ARC educational materials and participation in ARC project activities.

Selection and training of interviewers

A total of 14 interviewers (seven men and seven women) were selected for the March 2001 baseline survey based upon pre-determined criteria of education level, performance on math and English qualifying tests and comfort level with discussing sensitive topics. For the June 2003 post-intervention survey, 16 interviewers (eight men and eight women) were sought from among active ARC Port Loko volunteers and interviewers from previous ARC surveys, including four individuals who participated as interviewers in the baseline survey. Fourteen of the 16 were trained as active interviewers and two as back-up interviewers. In both surveys, interviewers represented different age groups and backgrounds in order to facilitate their acceptance by the respondent groups.

The baseline interviewers participated in a two-day training workshop and the post-intervention interviewers participated in a three-day training workshop. Training was conducted by the ARC Health Team and covered basic HIV/AIDS and STI knowledge, the survey instrument and interviewing skills. An important component of the training was discussion and agreement by the interviewers on the precise wording to use when administering the questionnaire in Temne and Krio, the primary languages spoken in Port Loko. Since these languages are not commonly written or read, it was impractical to prepare written translations in either language. Approximately once a week, the interviewers and ARC Health Team came together to discuss any issues or difficulties in the field.

Field procedures and data analysis

Members of the ARC Health Team served as field supervisers, each one working with two to four interviewers. Following the initial approach, the interviewers asked respondents to move to a secluded area where they could speak in private. They informed the respondents that all discussion and responses would remain confidential and that they had the right to refuse to answer questions at any time. Each interview

took an average of 20 minutes to complete. The fieldwork during the baseline survey was carried out in 15 days (1–15 March 2001) and the post-intervention survey fieldwork was carried out in 11 days (9–19 June 2003). Field supervisers collected completed questionnaires in the field for immediate coding.

Epi Info 2000 for Windows and Epi Info 2002 for Windows were used to enter and clean the baseline and post-intervention data, respectively. A combined database was created and the data analysed using Epi Info 2002. Chi-square analyses were performed using a $p<0.01$ significance level to ascertain differences between baseline and post-intervention results.

Results

Commercial sex workers

The CSW respondents had a mean age of 24 years at baseline and 26 years at post-intervention. They averaged 7.3 years of education at baseline and 6.2 years at post-intervention. At post-intervention, nine in 10 CSWs interviewed reported having remained in Port Loko for more than one year, increasing from just over half of CSWs in 2001 (see Table 1). The proportion of unmarried CSWs remained relatively stable,

Table 1 Socio-demographic profile of respondents: ARC Sierra Leone Baseline (2001) and Post-intervention (2003) surveys

	Commercial sex workers		*Military*	
	Baseline %	*Post-intervention %*	*Baseline %*	*Post-intervention %*
Age of respondents	*n=190*	*n=187*	*n=202*	*n=204*
15–24 years	56.8	48.1	9.4	6.4
25–49 years	43.2	51.9	90.6	93.6
Mean age	24.3 years	26.2 years	33.0 years	32.3 years
Education	*n=198*	*n=202*	*n=200*	*n=205*
None	19.7	36.6*	11.0	2.4*
1–7 years	23.2	11.9*	8.5	5.4*
>7 years	57.1	51.5*	80.5	92.2*
Mean	7.3 years	6.2 years	9.8 years	11.8 years
Duration in Port Loko	*n=199*	*n=201*	*n=202*	*n=205*
1 year or less	44.7	8.5*	84.7	69.8*
>1 year	55.3	91.5*	15.3	30.2*
Religion	*n=198*	*n=201*	*n=202*	*n=201*
Muslim	53.0	37.3*	52.0	47.3
Christian	47.0	62.7*	48.0	52.7
Marital status	*n=201*	*n=202*	*n=202*	*n=205*
Married	13.9	17.3	82.2	75.6
Not married	86.1	82.7	17.8	24.4

* Statistically significant difference between baseline and post-intervention ($p<0.01$, chi-square analysis).

at over 80 per cent. Approximately two in three interviewed at post-intervention were Christian and one in three was Muslim. This is a slight change from the nearly equal split between faiths found at baseline.

The levels of knowledge about HIV/AIDS among CSW respondents dramatically increased from the low levels found at baseline (see Table 2). Those CSW respondents who could spontaneously cite at least three correct routes of AIDS transmission increased to 69 per cent, representing a 60-percentage point jump from the 9 per cent found at baseline. In 2001, only 5 per cent of CSW respondents could name three or more effective means of avoiding AIDS; this figure rose to 70 per cent at post-intervention. The percentage of CSWs identifying three or more sources of condoms post-intervention (81 per cent) was found to be more than six times greater than the 13 per cent found at baseline.

Like levels of HIV/AIDS knowledge, the levels of STI knowledge among CSWs also increased significantly from baseline to post-intervention (see Table 2). Fewer than half (47 per cent) of CSWs were able to name spontaneously two or more signs of STIs at baseline and this increased to 88 per cent at post-intervention. The proportion able to name two or more adequate sources of STI care almost doubled from 32 per cent to 59 per cent. Those CSWs who reported it necessary to act quickly in treating an STI, already high at baseline (71 per cent), increased to 83 per cent of post-intervention respondents.

The increase in levels of knowledge is accompanied by a significant increase in reported condom use (see Figure 1). At post-intervention, 68 per cent of CSWs reported using a condom at their last sexual encounter as compared to only 38 per cent at baseline. At post-intervention 83 per cent reported having ever used a condom, as compared to 60 per cent at baseline. Sources of condoms also shifted. At baseline CSWs most frequently cited partners as their most recent source of condoms (34 per cent). At post-intervention, NGOs (23 per cent) and partners (23 per cent) were the most frequently cited sources.

A greater proportion of CSWs reported discussing condoms with their partners in the last six months at post-intervention (71 per cent) than at baseline (49 per cent). Additionally, among those CSWs who wanted to use a condom in the last six months and raised the topic with their partner, 83 per cent were met with partner agreement, a 20-percentage point increase from baseline (63 per cent).

The lack of concern of HIV infection among CSWs remained at a level similar to that found at baseline. The percentage of CSWs who reported they were not worried about AIDS (53 per cent) showed no change at post-intervention. The proportion of those who reported worrying 'a lot' about AIDS rose from 22 per cent to 34 per cent and the proportion who reported worrying 'a little' decreased from 26 to 14 per cent.

Negative attitudes towards people living with HIV/AIDS (PLWA) persisted among CSWs with almost half indicating that PLWA should be isolated or reported (47 per cent at baseline and 44 per cent at post-intervention). At the same time, levels of positive attitudes increased with those who reported that PLWA should be treated or counselled increasing from 49 per cent at baseline to 64 per cent at post-intervention.

Military forces

The military respondents had a mean age of 33 years at baseline and 32 years at post-intervention. Mean education was found to be 11.8 years at post-intervention, which

Table 2 Survey results: ARC Sierra Leone Baseline (2001) and Post-intervention (2003) surveys

	Commercial sex workers		*Military*	
	Baseline (n=201) %	*Post-intervention (n=202) %*	*Baseline (n=202) %*	*Post-intervention (n=205) %*
Selected knowledge items (unprompted)				
Know routes of AIDS transmission:				
Sex	74.6	90.1*	88.6	98.5*
Blood transfusion	29.9	67.8*	38.1	76.1*
Sharing sharp instruments	17.9	77.7*	47.0	89.8*
Mother to baby	9.0	45.0*	7.4	27.3*
Know ≥3 correct transmission routes	8.5	69.3*	22.8	75.1*
Know no transmission routes	19.9	7.4*	9.4	0.5*
Know means of avoiding AIDS:				
Use condoms during sex	71.6	90.6*	72.3	90.7*
Avoid sex entirely	20.9	73.3*	13.9	71.7*
Stay with one partner	26.9	42.1*	38.6	59.5*
Don't share razors or needles	13.9	74.8*	29.2	82.9*
Know ≥3 means of avoiding AIDS	5.0	70.3*	10.9	75.1*
Know no effective means of avoiding AIDS	13.9	6.9*	9.9	0.5*
Know ≥3 sources of condoms	12.9	80.7*	18.8	71.2*
Do not know any sources of condoms	14.9	5.4*	12.4	0.5*
Know ≥2 signs of STIs (burning, itching, discharge, sores)	46.8	88.1*	51.5	90.2*
Do not know any signs of STIs	22.9	7.4*	16.8	6.3*
Know ≥2 sources of *adequate* STI treatment (government hospital, NGO, military facility)	32.3	58.9*	35.1	50.7*
Know no sources of *adequate* STI treatment	11.9	4.5*	1.0	1.5
Selected attitude items (unprompted)				
Concern about becoming infected:				
Worried a lot	21.5	33.5*	54.0	49.3
Worried a little	25.5	13.7*	8.4	33.2*
Not worried	53.0	52.8	37.6	17.6*
Believe people with AIDS should be:**				
Treated or counselled	48.8	63.9*	61.9	90.2*
Isolated or reported	46.8	43.6	63.9	60.5

* Statistically significant difference between baseline and post-intervention ($p<0.01$, chi-square analysis).

** Respondents were able to select more than one attitude, so total percentages may exceed 100%.

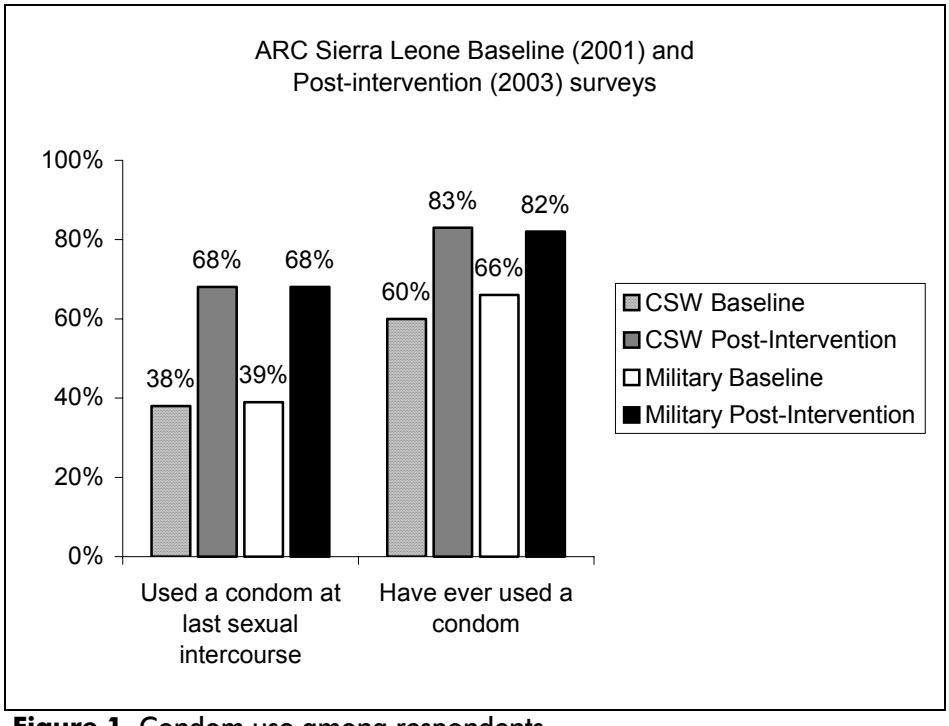

Figure 1 Condom use among respondents

was two years greater than the mean education found in the military respondents of 2001 (9.8 years). Thirty per cent of military respondents had been in Port Loko for over one year at post-intervention, a proportion which doubled from baseline (see Table 1). Only one in four military respondents at post-intervention was not married, a rate not significantly different from baseline. In both surveys, approximately half of the military respondents identified themselves as Christian, while half identified themselves as Muslim.

Like the CSWs, military respondents demonstrated striking increases in levels of knowledge about HIV/AIDS between baseline and post-intervention (see Table 2). The proportion of military respondents able to name spontaneously three or more correct routes of HIV transmission tripled from under one-fourth to three-fourths of respondents. Those able to cite three or more effective means of avoiding AIDS rose from 11 per cent to 75 per cent. Additionally, the proportion of military respondents who identified at least three sources of condoms increased from 19 per cent to 71 per cent. Notably, almost all (99 per cent) military respondents named sex as a route of AIDS transmission.

As with levels of HIV/AIDS knowledge, levels of STI knowledge among military respondents also showed a marked increase between baseline and post-intervention (see Table 2). The proportion of military respondents able to name two or more signs of STIs rose to nine in 10 respondents from five in 10 at baseline. Those able to identify two or more adequate sources of STI care increased significantly from one-third to one-half of respondents. Health-seeking attitudes and behaviours among military respondents remained remarkably high. At post-intervention almost all (97 per cent) believed it necessary to act quickly to treat an STI, an increase from 85 per cent at baseline.

Reported condom use among military respondents was found to be at considerably higher levels in 2003 than in 2001 (see Figure 1). At post-intervention, 82 per cent of military respondents reported having ever used a condom up from 66 per cent in 2001, while the proportion of those who reported using a condom at last sexual intercourse increased from 39 per cent to 68 per cent of respondents. The most frequently cited recent source of condoms for this group remained the military itself (51 per cent at baseline and 58 per cent at post-intervention).

The proportion of military respondents who reported discussing condoms with a partner in the last six months increased significantly from 49 per cent to 78 per cent of respondents. Nearly all those military respondents in 2003 who wanted to use a condom and who raised the topic with their partners in the last six months received a favourable response: 93 per cent of military respondents reported partner agreement, up from 64 per cent agreement at baseline.

There was a shift in personal concern about AIDS among the military respondents. The proportion of military respondents who reported they were not worried about AIDS decreased from 38 per cent to 18 per cent. Those who reported worrying 'a little' increased from 8 per cent to 33 per cent while those who reported worrying 'a lot' declined from 54 per cent to 49 per cent.

Levels of positive attitudes towards PLWA increased for military respondents, although negative attitudes persisted at substantial levels. The proportion of military respondents believing that PLWA should be treated or counselled increased from 62 per cent to 90 per cent. However, the proportion who reported believing PLWA should be isolated or reported remained constant at 64 per cent of military respondents at baseline and 61 per cent of military respondents at post-intervention.

Differences within the military: UNAMSIL and RSLAF

Considerable gaps in knowledge and behaviour existed within the military sample. For example, at post-intervention, only 55 per cent of RSLAF respondents cited three or more correct routes of transmission while 94 per cent of UNAMSIL did so. The proportions able to name three or more effective means of avoiding AIDS at post-intervention was 57 per cent among RSLAF and 92 per cent among UNAMSIL. Also, 49 per cent of RSLAF respondents but 92 per cent of UNAMSIL forces were able to cite three or more sources of condoms at post-intervention. Such gaps also existed in condom use. While 91 per cent of UNAMSIL respondents at post-intervention reported having ever used a condom, only 73 per cent of RSLAF respondents reported having done so. Also, 85 per cent of UNAMSIL respondents at post-intervention reported condom use at last sexual intercourse as compared to only 48 per cent of RSLAF respondents.

Differences in the socio-demographic profiles of the UNAMSIL and RSLAF respondents may account for some of the differences in knowledge and behaviour between the two groups. The RSLAF respondents were slightly younger (mean age 31 years) than the UNAMSIL respondents (mean age 33 years). In addition, RSLAF respondents had somewhat less education with a mean of 10 years of schooling, as compared to 13 years for UNAMSIL respondents. No significant differences in marital status or religion were noted. Although the somewhat higher age and education levels of the UNAMSIL respondents may explain in part the improved knowledge and behaviour, it is unlikely that they alone account for the considerable gaps between the two groups.

Discussion

Study limitations

The limitations of this survey must be considered to prevent misinterpretation of the results. Although attempts were made to reach a broad group in each quota category (commercial sex workers and military personnel), the sample was not a random sample, as noted above. Thus, bias may have been introduced based on those selected to be interviewed, especially in the case of CSWs where the selection criteria were somewhat subjective. Bias may have also been introduced by the possibility of systematic under-representation of individuals who spend most of their time in their homes. Additionally, although we believe the survey to be indicative of the knowledge, attitudes and practices of the groups of interest in Port Loko town, the results cannot be applied to the general population or to other areas of Sierra Leone.

Although respondents were selected in as similar a manner as possible at baseline and post-intervention, significant differences exist in the socio-demographic profiles of each baseline and post-intervention group. Both CSW and military respondents showed significant differences in duration in Port Loko and education level between the baseline and post-intervention periods and CSWs also showed a significant difference in religion. While change in the duration in Port Loko might be expected with peacetime resettlement and rotation of military units in deployment, reasons for differences in education levels and religion are less clear. It is also unclear to what degree these differences may have affected survey answers provided by baseline and post-intervention respondents.

It is the perception of the interviewers and supervisers that respondents were largely forthcoming during the interviews, providing open and honest answers to the questions posed. Nevertheless, as in all surveys, respondents may have modified their answers according to social norms or their perceptions of interviewer expectations.

Finally, without a control group, a direct causal link cannot be drawn between the survey results and ARC's intervention efforts alone. This is important to note as HIV/AIDS education and awareness has grown with the recent establishment of the Sierra Leone National HIV/AIDS Secretariat, the Sierra Leone HIV/AIDS Response Project (SHARP) launched in December 2002 and the UN Security Council Resolution 1308 (July 2000) which calls for the incorporation of HIV/AIDS awareness in its training for UN peacekeepers (UN, 2004; World Bank, 2002; Bazergan, 2002). However, due to the extensive outreach of ARC in the Port Loko community and ARC's regular collaboration in the HIV/AIDS education activities of the government, military, CSWs and community organisations, we believe the survey findings accurately reflect changes in the surveyed populations resulting, at least in part, from ARC's efforts.

Conclusions

The conclusions reached based upon the results of the baseline and post-intervention surveys have important implications for AIDS-prevention efforts among CSWs and military forces in Port Loko and Sierra Leone more widely. As the conclusions involve issues to be addressed at a broad policy level, the success of any AIDS-prevention

programme in Sierra Leone is ultimately dependent upon collaboration with the government of Sierra Leone, military authorities, NGOs and the community.

The levels of HIV/AIDS and STI knowledge and condom use increased dramatically among CSWs and military forces in Port Loko, suggesting that intensive education and outreach efforts have had a positive effect. Yet, there is still much work to be done to raise awareness and change behaviour. While approximately three-fourths of respondents surveyed in 2003 were able to name three or more correct routes of AIDS transmission, effective means of avoiding AIDS and sources of condoms, another one in four remained unable to do so. Notably, only two-thirds of respondents at post-intervention reported using a condom at last sexual intercourse. However, because these groups are thought to be 'core transmitters' of HIV and STIs, correct and consistent condom use is essential for stopping the spread of HIV and STIs in the community and should be more widespread (Plummer et al., 1991; Moses et al., 1991). Efforts with the military must attempt to close the knowledge and behaviour gaps between RSLAF and UNAMSIL forces, especially as the RSLAF members remain in Sierra Leone while UNAMSIL is scheduled to withdraw from the country in December 2004 (UNOCHA, 2003). Thus, it is vitally important that HIV-awareness and condom-promotion activities targeting CSWs and military personnel, with an increased focus on RSLAF troops, continue.

While levels of STI knowledge significantly increased for CSWs and military, knowledge of adequate sources of STI care remained very low. Only a little over one-half of respondents in either group surveyed were able to name two or more sources of qualified STI care which is alarming given the documented link between STIs and HIV transmission (Fleming et al., 1999). Pharmacies and traditional remedies were cited by respondents as adequate sources of care at even greater levels than at baseline (e.g., 51 per cent of CSWs cited traditional remedies at post-intervention compared to 21 per cent at baseline). This indicates that increased efforts are needed to ensure that target groups receive good-quality STI education and treatment in order to curb the potentially devastating effects of untreated or improperly treated STIs including infertility, extensive damage to the reproductive system and death (Asowa-Omorodion, 2000). Special attention should also be paid to partner notification for their own health and so that cured individuals are not re-infected (UNAIDS, WHO, UNHCR, 1995). With this in mind, it is essential to support health facilities in the provision of high-quality STI treatment.

Levels of personal concern about AIDS among CSWs and military forces in Port Loko remained relatively low, despite significant increases in knowledge. For instance, half of the CSWs surveyed remain not worried about contracting HIV. According to a variety of behavioural theories such as the health belief model and the theory of reasoned action, individuals must perceive risk in order to take preventive actions (Rosenstock, 1990; Ajzen et al., 1980). Given the very real risk faced by CSWs and military personnel documented in many countries around the world, it is critical that these high-risk groups recognise the personal danger associated with HIV/AIDS and STIs. It should be noted that the increase in reported condom use does suggest that these groups are willing to engage in safer sex behaviour. Therefore, further efforts to increase recognition of personal risk coupled with the means to address that risk (for example, condoms and negotiation skills) may further increase safer sex behaviour among CSWs and military forces in Port Loko.

Negative attitudes persisted towards people living with HIV/AIDS (PLWA). While the proportion of CSW and military respondents who believed PLWA should be treated or counselled increased, this did not affect the substantial levels of negative

attitudes. It is clear in this particular setting that increasing knowledge is necessary but not sufficient to decrease stigma. Therefore, future educational and outreach efforts need to focus on supporting positive attitudes and decreasing negative attitudes.

A substantial proportion of CSWs and military respondents relied upon NGOs for condoms, as almost one in four respondents from both groups cited NGOs as their most recent source of condoms at post-intervention. With support from the Sierra Leone Ministry of Health and Sanitation, ARC distributed free condoms during community outreach activities and organised condom distributors, such as bar owners and peer educators, to reach target populations in Port Loko. Thus, the respondents' reliance on NGOs for condoms is especially notable given that a wide variety of sources distributing free condoms were available in the community. If NGOs begin to pull out of Sierra Leone as the country recovers from crisis, the respondents' reliance on NGOs for condoms will become an important issue. The social marketing of condoms at a nominal price would be one way to ensure that condoms remain available even when NGOs reduce their activities (UNAIDS, 1998). In addition, condoms that are purchased tend to be more highly valued and more likely to be used than those given away for free (ibid.). Given that results from these surveys indicate that condom use among target populations in Port Loko rose considerably, the sale of condoms for small sums presents itself as a possible activity with greater long-term sustainability than free distribution. However, in view of the poverty in Sierra Leone, this option should be phased in over time and monitored well to ensure that condoms are not priced beyond most individuals' means.

Results from ARC's KAP surveys indicate that levels of knowledge about HIV/AIDS and STIs and condom use increased substantially in the CSW and military populations of Port Loko, Sierra Leone. These results suggest that widespread information, education and communication activities and free condoms were effective in promoting change among these groups. It is hoped that these results will aid in the continuation and improvement of AIDS-prevention activities in Sierra Leone, especially with regard to decreasing stigma and increasing personal risk awareness. Additionally, despite the challenges inherent in a post-conflict country, we believe these results suggest that good-quality AIDS-prevention programmes can be effective and should be implemented.

Notes

1. The ARC Health Team consisted of one Team Manager, four AIDS Prevention Officers, and one STI Prevention Officer, all possessing advanced degrees in health-care.
2. Civil Defence Forces were local military groups who supported the government against the RUF.
3. For a copy of the survey instrument, please contact the corresponding author.

References

Ajzen, I. and M. Fishbein (1980) *Understanding Attitude and Predicting Social Behavior*. Prentice Hall, Englewood Cliffs.

Aklilu, M., T. Messele, A. Tsegaye, T. Biru, D.H. Mariam, B. van Benthem, R. Coutinho, T.R. de Wit and A. Fontanet (2001) Factors Associated with HIV-1 Infection among Sex Workers of Addis Ababa, Ethiopia. *AIDS* 15(1): 87–96.

Alary, M., L. Mukenge-Tshibaka, F. Bernier, N. Geraldo, C.M. Lowndes, H. Meda, C.A.B. Gnintoungbè, S. Anagonou and J.R. Joly (2002) Decline in the Prevalence of HIV and Sexually Transmitted Diseases Among Female Sex Workers in Cotonou, Benin, 1993–1999. *AIDS* 16: 463–70.

Amowitz, L.L., C. Reis, K.H. Lyons, B. Vann, B. Mansaray, A.M. Akinsulure-Smith, L. Taylor and V. Iacopino (2002) Prevalence of War-related Sexual Violence and Other Human Rights Abuses Among Internally Displaced Persons in Sierra Leone. *Journal of the American Medical Association* 287(4): 513–21.

ARC International, Sierra Leone (August 2003) RHRC Consortium Monitoring and Evaluation Program, Strengthening AIDS Prevention in Port Loko: Post-Intervention Survey Report – HIV/AIDS/STI Knowledge, Attitudes and Practice (KAP) Survey among Commercial Sex Workers, Military and Youth in Port Loko, Sierra Leone.

Asowa-Omorodion, F.I. (2000) Sexual and Health Behaviour of Commercial Sex Workers in Benin City, Edo State, Nigeria. *Health Care for Women International* 21: 335–45.

Bazergan, R. (2002) HIV/AIDS and Peacekeeping: A Field Study of the Policies of the United Nations Mission in Sierra Leone. International Policy Institute, King's College, London.

Carballo, M., J. Cilloniz and S. Braunschweig (2001) HIV/AIDS and Security. International Center for Migration and Health, Geneva.

CIA (2003) World Factbook 2003, Sierra Leone. See http://www.cia.gov/cia/publications/factbook/geos/sl.html.

Fleming, D.T. and J.N. Wasserheit (1999) From Epidemiological Synergy to Public Health Policy and Practice: the Contribution of Other Sexually Transmitted Diseases to Sexual Transmission of HIV Infection. *Sexually Transmitted Infections* 75(1): 3–17.

Foreman, M. (2002) *Combat AIDS: HIV and the World's Armed Forces*. Healthlink Worldwide, London.

General Accounting Office (GAO) (2001) UN Peacekeeping: UN Faces Challenges in Responding to the Impact of HIV/AIDS on Peacekeeping Operations. GAO, Washington.

Global IDP Project (2003) Profile of Internal Displacement: Sierra Leone. http://www.db.idpproject.org/Sites/idpSurvey.nsf/wCountries/Sierra%20Leone/$File/Sierra%20Leone%20-October%202003.pdf?OpenElement.

Human Rights Watch (2002) The Jury Is Still Out: A Human Rights Watch Briefing Paper on Sierra Leone. See http://hrw.org/backgrounder/africa/sl-bck0711.htm.

Kaiser, R., P. Spiegel, P. Salama, W. Brady, E. Bell, K. Bond and M. Downer (2002) HIV/AIDS Seroprevalence and Behavioral Risk Factor Survey in Sierra Leone, April 2002. Centers for Disease Control and Prevention, Atlanta.

Khaw, A.J., P. Salama, B. Burkholder and T.J. Dondero (2000) HIV Risk and Prevention in Emergency-affected Populations: A Review. *Disasters* 24(3): 181–97.

Kosia, A., T. Kargbo and E. Makiu (1989) Prevalence of HIV-1 and HIV-2 Among Blood Donors in Sierra Leone. Poster presentation no. 390. Fourth International Conference, AIDS and Associated Cancers in Africa, Marseilles.

—— , T. Kargbo and I. Thorlie (1989) Prevalence of HIV Seropositivity among STD Patients in Freetown, Sierra Leone. Poster presentation no. WGP 16, International Conference on AIDS, Montreal.

Lankoandé, S., N. Meda, L. Sangaré, I.P. Compaoré, J. Catraye, P.T. Sanou, E. Van Dyck, M. Cartoux, O. Sankara, V. Curtis and R.B. Soudré (1998) Prevalence and Risk of HIV Infection Among Female Sex Workers in Burkina Faso. *International Journal of STD and AIDS* 9: 146–50.

Lydié, N. and N.J. Robinson (1998) West and Central Africa. *International Migration* 36(4): 469–511.

Makiu, E., A.M. Kosia and N. Mansarary (1992) A Strategy to Control HIV infection among Female Commercial Sex Workers (CSW) and Their Clients in Freetown, Sierra Leone. Abstract presentation no. TP 98. Seventh Intl Conference on AIDS in Africa, Yaoundé.

Moses, S., F.A. Plummer, E.N. Ngugi, N.J. Nagelkerke, A.O. Anzala and J.O. Ndinya-Achola (1991) Controlling HIV in Africa: Effectiveness and Cost of an Intervention in a High-Frequency STD Transmitter Core Group. *AIDS* 5(4): 407–11.

Newman, L.M., F. Miguel, B.B. Jemusse, A.C. Macome and R.D. Newman (2001) HIV Seroprevalence among Military Blood Donors in Manica Province, Mozambique. *International Journal of STD and AIDS* 12: 225–8.

Orroth, K.K., A. Gavyole, J. Todd, F. Mosha, D. Ross, E. Mwijarubi, H. Grosskurth and R.J. Hayes (2000) Syndromic Treatment of Sexually Transmitted Diseases Reduces the Proportion of Incident HIV Infection Attributable to These Diseases in Rural Tanzania. *AIDS* 14(10): 1429–37.

Plummer, F.A., N.J. Nagelkerke, S. Moses, J.O. Ndinya-Achola, J. Bwayo and E. Ngugi (1991) The Importance of Core-Groups in the Epidemiology and Control of HIV-1 Infection. *AIDS* 5(Suppl 1): S169–76.

Richter, D.L., M.J. Harris, A.L. Coker and J. Fraser (2001) Limiting the Spread of HIV/AIDS in Sierra Leone: Opportunities for Intervention. *Journal of the Association of Nurses in AIDS Care* 12(5): 48–54.

Rosenstock, I.M. (1990) The Health Belief Model: Explaining Health Behavior Through Expectancies. In K. Glanz, F. Lewis and B. Rimer (eds.) *Health Behavior and Health Education Theory, Research and Practice*. Jossey-Bass, San Francisco.

Save the Children (2002) *HIV and Conflict: A Double Emergency*. Save the Children UK, London.

UNAIDS (May 1998) *AIDS and the Military: Point of View*. UNAIDS Best Practices Collection, Geneva.

—— (1998) Social Marketing: An Effective Tool in the Global Response to HIV/AIDS. See http://www.unaids.org/html/pub/publications/irc-pub01/jc167-socmarketing_en_pdf.htm.

—— , WHO, UNHCR (1995) Guidelines for HIV Interventions in Emergency Settings. See http://www.rhrc.org/pdf/hivguide.pdf.

UNHCR News Stories (2001) Sex as 'Currency' Makes Refugee Women More Vulnerable to AIDS, 17 July.

Unicef (2003) State of the World's Children 2004. See http://www.unicef.org/files/SOWC_O4_eng.pdf.

United Nations (2004) Transitional Appeal for Relief and Recovery: Sierra Leone, 2004. See http://ochadms.unog.ch/quickplace/cap/main.nsf/h_Index/CAP_2004_SierraLeone/$FILE/CAP_2004_SierraLeone_SCREEN.PDF?OpenElement.

UN Department of Peacekeeping Operations (UN DPKO) (2004) United Nations Mission in Sierra Leone. See http://www.un.org/Depts/dpko/missions/unamsil/index.html.

UN Office for the Coordination of Humanitarian Affairs (UNOCHA) (2003) Sierra Leone: Humanitarian Situation Report, July 2003. See http://www.reliefweb.int/w/rwb.nsf/0/dc18d378d9e0504185256d820067e6d1?OpenDocument.

US Committee for Refugees (USCR) (2003) World Refugee Survey 2003 Country Report: Sierra Leone. See http://www.refugees.org/world/countryrpt/africa/2003/sierra_leone.cfm.

—— (2002) World Refugee Survey 2002 Country Report: Sierra Leone. See http://www.refugees.org/world/countryrpt/africa/2002/sierra_leone.cfm.

—— (2001) World Refugee Survey 2001 Country Report: Sierra Leone. See http://www.refugees.org/world/countryrpt/africa/2001/sierra_leone.htm.

WHO (2000) HIV/AIDS in Sierra Leone: The Future at Stake. The Strategic and Organisational Context and Recommendations for Action. WHO, Freetown.

WHO (2001) Current Health Situation In Sierra Leone, 6 March. See http://www.who.int/disasters/repo/6459.doc.

World Bank (2002) President Kabbah Launches Program to Combat HIV/AIDS in Sierra Leone. See http://www.worldbank.org/afr/sl/sl_VP_PR_121002.pdf .

Yeager, R. (n.d.) AIDS Brief for Sectoral Planners and Managers: Military Sector. AIDS Briefs Series.

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