

HIV SURVEILLANCE IN COMPLEX EMERGENCIES

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Abstract

Many studies have shown a positive association between both migration and temporary expatriation and HIV risk. This association is likely to be similar or even more pronounced for forced migrants. In general, HIV transmission in host-migrant or host-forced-migrant interactions depends on the maturity of the HIV epidemic in both the host and the migrant population, the relative seroprevalence of HIV in the host and the migrant population, the prevalence of other sexually transmitted infections (STIs) that may facilitate transmission, and the level of sexual interaction between the two communities. Complex emergencies are the major cause of mass population movement today. In complex emergencies, additional factors such as sexual interaction between forced-migrant populations and the military; sexual violence; increasing commercial sex work; psychological trauma; and disruption of preventive and curative health services may increase the risk for HIV transmission.

Despite recent success in preventing HIV infection in stable populations in selected developing countries, internally displaced persons and refugees (or forced migrants) have not been systematically included in HIV surveillance systems, nor consequently in prevention activities. Standard surveillance systems that rely on functioning health services may not provide useful data in many complex emergency settings. Secondary sources can provide some information in these settings. Little attempt has been made, however, to develop innovative HIV surveillance systems in countries affected by complex emergencies. Consequently, data on the HIV epidemic in these countries are scarce and HIV prevention programs are either not implemented or interventions are not effectively targeted.

Second generation surveillance methods such as cross-sectional, population-based surveys can provide rapid information on HIV, STIs, and sexual behavior. The risks for stigmatization and breaches of confidentiality must be recognized. Surveillance, however, is a key component of HIV and STI prevention services for forced migrants. It is required to define the high risk groups, target interventions, and ultimately decrease HIV and STI transmission within countries facing complex emergencies. It is also required to facilitate regional control of HIV epidemics.

Introduction

"Talking in one breath about AIDS and human migration is dangerous. Many of us have preferred to remain silent on this issue out of fear of having our analyses denatured into arguments for mass testing and deportation. But silence has ceased to be an option." (Decosas et al., 1995 [1].)

In recent years, the public health community has claimed some success in the fight against the HIV pandemic; changes in risk behavior and an HIV prevalence that has decreased within certain populations in relatively politically stable developing countries such as Thailand and Uganda. In Thailand, HIV cross-

sectional prevalence rates in young male military conscripts have steadily decreased in recent years [2]. Such positive changes have not yet been demonstrated in most developing countries, and even within countries making progress, there are segments of the population that either have not benefited from the same decreasing HIV seroprevalence trends or whose seroprevalence rates remain unknown. Data on forced migrants, for example, may not be captured by conventional surveillance systems, whether active or passive, because these groups do not access sites that report surveillance data or because data are not collected in a fashion that allows disaggregated analysis. Furthermore, even if forced migrants were able to access these sites, this type of surveillance is unlikely to provide data that is representative of the entire forced-migrant population.

In addition, the HIV epidemic has generally received little attention in countries affected by complex emergencies in which a large proportion of the population may be or may previously have been forced migrants. The term complex emergency originally described relatively acute situations affecting large civilian populations and usually involving a combination of war or civil strife, food shortages and population displacement resulting in significant excess mortality [3]. Complex emergencies, however, have extended for many years in countries such as Angola, southern Sudan, Somalia, and Sierra Leone and caused massive forced migration.

For the purposes of this article, the term 'forced migrants' will refer both to internally displaced persons and to refugees. Refugees are defined as people who have crossed international borders fleeing war or persecution due to race, religion, nationality, or membership in a particular social or political group. They are protected by several international conventions and are entitled to the protection and assistance of the United Nations High Commissioner for Refugees (UNHCR) [4]. Internally displaced persons may flee their homes for the same reasons as refugees but, because they have not crossed international borders, they cannot invoke the same protection and assistance under international law.

Migration and HIV risk

Since AIDS was first identified, there has been substantial interest in the geographic origin of the disease and the role that migration has played in the spread of the epidemic. Among immigrants to developed countries, recent studies have collected detailed information about risk behaviors, sexual mixing patterns and determinants of disassortative mixing. In a cross-sectional study in Amsterdam, 42.9% of the steady partners of Nigerian men and 53.8% of their casual partners were of Dutch origin [5]. The authors concluded that bridges do exist for the sexual transmission of HIV from one ethnic group to another. Of note is that the authors in this study recruited participants directly from market places, community houses, churches and a sports center because the registration system for immigrants was not complete.

In the developing world, studies have repeatedly demonstrated that migrants are at higher risk for HIV infection than resident populations. The emphasis in past studies has been on rural residents, often with low HIV prevalence and knowledge, migrating to urban centers. The phenomenon of male migrants living without their families and frequenting commercial sex workers (CSWs) with very high HIV seroprevalence rates has been well documented in countries such as Cote d'Ivoire, where more than 40% of the population of the capital city are reported to be migrants [1]. Increased HIV risk has also been associated with both internal seasonal migration [6] and temporary expatriation [7] in Senegal.

As most studies have been cross-sectional, it has been difficult to demonstrate whether migrants brought a higher prevalence of HIV with them when they traveled, had riskier behaviors upon migration, or were more vulnerable to HIV for social reasons after migration. Migration may be an independent risk factor for HIV risk, regardless of destination or origin. A longitudinal cohort study in rural Uganda showed an inverse relationship between years lived at current residence and both seroprevalence and sero-incidence [8]. Furthermore, although the highest age- and sex-standardized seroprevalence rates were recorded for those who had come from another region (16.3%), seroprevalence rates were also significantly higher for those who moved within the local area (12.4%) or within the village itself (8.2%) than for those who had not changed address (5.5%) during the study period. This indicates that although the rural-urban migrant group is important, even movement within local areas is associated with an increased risk for HIV.

HIV vulnerability, therefore, may be determined, not by the origin or destination of migration, but by the social disruption that characterizes certain types of migration [1]. If this is true, then complex emergencies, which usually involve such disruptive migration on a large scale, may represent an important collective risk factor for HIV transmission.

Complex emergencies have become more common, particularly in Africa, and have contributed to the flight of approximately 13.5 million refugees and 17 million internally displaced persons worldwide [9]. Significant advances have been made by the humanitarian community in developing and improving technical standards in many important areas of public health in complex emergencies, such as mass vaccination programs, adequate water and sanitation facilities, and provision of food of a quality and quantity that meets basic energy and micronutrient requirements. In addition there is a growing interest in reproductive health in complex emergencies [10]. As yet, however, this interest has not translated into systematic access to HIV and sexually transmitted infection (STI) prevention and treatment programs for forced migrants; a lack of data indicating the extent of the problem and the risk groups in emergencies has contributed to the low priority that these programs have received.

HIV epidemic patterns in complex emergencies

The pattern of HIV transmission in complex emergencies may differ substantially from that of more stable environments in which HIV surveillance systems have traditionally been implemented. The social and behavioral patterns that may increase HIV transmission in complex emergencies include disruption of societal structures and mores, family units, and sexual networks; sexual interaction between displaced civilians and military personnel; economic vulnerability of women and unaccompanied minors; frequency of commercial sex work; sexual violence and coercive sex; psychological trauma; and the increased use of illicit drugs [10,11].

On a population basis, the mechanism of HIV transmission in host-forced-migrant interactions depends on a number of factors, including the maturity of the HIV epidemic in both the host and the forced-migrant population, the relative seroprevalence of HIV in the host and the forced-migrant population, the prevalence of other STIs that may facilitate transmission, the level of sexual interaction between the two communities, the presence of context-specific factors such as systematic rape by military or paramilitary groups, and the level and quality of HIV prevention and STI treatment services [11].

The patterns through which forced migration potentially affects HIV transmission can be divided into three major categories:

Type A: where HIV prevalence among forced migrants is thought to be lower than that of the host population, such as Somali refugees in Ethiopia [12];

Type B: where HIV prevalence among forced migrants is thought to be higher than that of the host population, such as Rwandan refugees in the Ngara district of Tanzania [13];

Type C: where forced migrants in two regions of a country have differences in HIV prevalence due to the differential effects of war in various parts of the country as may be the case in Sierra Leone. (Verbal communication, 2/2/00, Dr Patrick Moses, director national AIDS control program, Sierra Leone).

HIV risk may depend upon whether camps are closed (e.g. Vietnamese camps in Hong Kong and Thailand), open (e.g. Sudanese camps in Uganda) or where populations are integrated into the community (e.g. Sierra Leonians in Guinea). An estimated 60-75% of Africa's refugees may have never lived in camps [14], and in recent emergencies, a large proportion of refugees have sought assistance and shelter directly from host populations [15]. Until now, however, the limited HIV prevention activities for refugees have been oriented towards camp populations.

Current systems for HIV surveillance in complex emergencies

In politically stable, sub-Saharan African countries with generalized epidemics, unlinked anonymous testing in sentinel populations, and typically at specific sentinel sites, has been the method generally used for HIV surveillance. This method is often combined with HIV and AIDS case reporting and has been termed first generation surveillance. Generalized HIV epidemics are defined as epidemics in which the HIV seroprevalence is greater than 1% among pregnant women. Because HIV epidemics are generalized epidemics in most sub-Saharan Africa countries, HIV epidemics among the large forced-migrant populations there (Table 1) will also tend to be generalized epidemics. In these situations, antenatal or sexually transmitted disease (STD) clinic data, if available and of good quality, might provide useful information.

Table 1. Sub-Saharan African countries with major populations of forced migrants in 1999

Country of asylum/residence	Refugees	Asylum-seekers	Returned refugees	Internally displaced	Returned IDPs	Various	Total
Angola	13 100	930	41 100				55 130
Burundi	22 100	510	36 000	50 000	50 000	10 590	169 200
Cote d'Ivoire	138 400	660					139 060
DRC	285 300	170	79 800				365 270
Eritrea	3 000		7 900				10 900
Ethiopia	257 700	2 010	14 600				274 310
Guinea	501 500	430					501 930
Kenya	223 700	5 800	10				229 510
Liberia	96 300	30	297 000	90 600	113 600		597 530
Rwanda	34 400	1 770	49 200		626 100		711 470
Sierra Leone	6 600	30	198 100	500 000			704 730
Somalia	130		77 400				77 530
Sudan	391 000		260				391 260
Tanzania	622 200	12 330					634 530
Uganda	218 200	180	1 200				219 580
Zambia	206 400	180					206 580
Total	3 020 030	25 030	802 570	640 600	789 700	10 590	5 288 520

Data source: Refugees and Others of Concern to UNHCR, 1999 Statistical Overview (<http://www.unhcr.ch/statist/qqoview/tab102.pdf>). IDPs, internally displaced persons; DRC, Democratic Republic of Congo.

In order to evaluate trends over time using sentinel surveillance, however, a relatively stable composition of the sentinel populations and consistency of sentinel sites, as well as a periodic and standardized sampling frame, are minimum requirements [16]. Although continuity may be an achievable goal in some long-term refugee sites, such as Sudanese camps in northern Kenya, fluctuating denominators with large population movements are more typical. This makes the interpretation of trends difficult. Furthermore, the usual sites for conducting sentinel surveillance, such as antenatal and STD clinics, that may function in stable, long-term refugee camps are rarely present in emergencies.

As discussed previously, complex emergencies are likely to fundamentally alter the dynamic of the HIV epidemic. Therefore, although most epidemics in complex emergencies in Africa will still be generalized epidemics, depending on the specific context, certain subpopulations may have a much higher incidence of infection than the general population. Multiple epidemics with very different transmission patterns may occur within the same population.

AIDS surveillance in these settings may also be impractical. It does not provide timely or useful data because of the delay between infection and onset of clinical symptoms, as well as substantial under-detection and under-reporting where stigma is attached to the diagnosis and medical care is relatively unsophisticated. Chronic diarrheal illness, fever of unknown origin, recurrent pneumonia, wasting syndromes, meningitis, and tuberculosis may frequently be secondary to AIDS-related immunosuppression but are rarely attributed to HIV in reporting systems. Similarly, in children, failure to thrive, cachexia, developmental retardation, and recurrent bacterial infections are rarely designated as HIV-related. This under-reporting may be attributable partly to difficulties in diagnosing HIV/AIDS in the absence of testing facilities, lack of familiarity of western-trained clinicians with manifestations of the disease in developing countries, and reluctance on the part of those who do recognize it to risk stigmatizing their patients [11]. HIV case reporting is also generally not useful because too few people have access to testing to enable results to be generalized.

As shown in Tables 2 and 3, HIV data are scarce for countries affected by complex emergencies in the 1990s in sub-Saharan Africa, where the HIV epidemic has had by far the biggest impact. In most of these countries, national surveillance data are derived from only one or two urban and rural antenatal care (ANC) clinics. Data from STD clinics are similarly scarce, particularly for rural clinics. As expected, AIDS case reporting is so grossly underestimated that figures are not useful. Behavioral data are also inadequate. Overall, these data tend to grossly underestimate the magnitude of the epidemic in these countries and show that this system is not providing timely, representative or useful information.

Table 2. Latest available data on HIV seroprevalence rates in sub-Saharan African countries affected by major complex emergencies in the 1990s^a

Country	1999 population (thousands)	Antenatal clinics						STI clinics					
		Urban			Non-urban			Urban			Non-urban		
		No. sites	Prevalence	Year	No. sites	Prevalence	Year	No. Sites	Prevalence	Year	No. Sites	Prevalence	Year
Angola	12 479	1	1.2	1995	1	8.5	1996	1	2.5	1992	1	12.7	1988
Burundi	6565	1	18.6	1998	1	19.7	1998	N/A	N/A	N/A	1	18.5	1986
DRC	50 335	3	4.1	1999	1	8.5	1999	1	12.2	1997	1	8.3	1997
Eritrea	3719	N/A	N/A	N/A	1	3	1994	1	9.5	1994	N/A	N/A	N/A
Ethiopia	61 095	4	17.6	1997	5	9.2	1998	2	37.5	1992	N/A	N/A	N/A
Liberia	2930	1	4	1993	1	10.1	1998	1	8	1993	N/A	N/A	N/A
Rwanda	7235	2	19	1997	3	7.5	1997	2	41.8	1996	N/A	N/A	N/A
Sierra Leone	4717	1	2	1992	N/A	N/A	N/A	1	3.3	1992	N/A	N/A	N/A
Somalia	9672	1	0	1985	2	2.0	1997	1	0	1990	N/A	N/A	N/A
Sudan	28 883	1	0.5	1998	2	3.8	1998	N/A	N/A	N/A	1	3.23	1997
Botswana ^b	1597	3	43	1998	6	30	1998	3	60.04	1998	6	52.8	1998

^a Data Source: UNAIDS Epidemiological Fact Sheet on HIV/AIDS and sexually transmitted infections, 2000 update (<http://www.unaids.org/hiv/aidsinfo/statistics/june00/fact-sheets/pdfs/>). ^b Botswana included for comparison as a poorly resourced sub-Saharan African country not affected by a complex emergency in the 1990s. N/A, no data available, otherwise last year reported is included; STI, sexually transmitted infections; DRC, Democratic Republic of Congo.

Table 3. Latest available data for reported AIDS cases, HIV case estimates, and key behavioral indicators for sub-Saharan African countries affected by complex emergencies in the 1990s^a

Country	1999 Population (thousands)	AIDS cases reported		Estimated HIV cases		Behavioral data			
		No. cases	Year	No. cases	Year	Preventive practice knowledge ^b		Condom use ^c	
						%	Year	%	Year
Angola	12 479	507	1998	160 000	1999	95	1997	36.3 ^e	1997
Burundi	6565	2187	1999	360 000	1999	N/A	N/A	N/A	N/A
DRC	50 335	22	1999	1 100 000	1999	N/A	N/A	N/A	N/A
Eritrea	3719	1086	1999	49 000 ^d	1999	78	1995	N/A	N/A
Ethiopia	61 095	8314	1998	3 000 000	1999	83.8 ^e	1994	47.1 ^e	1994
Liberia	2930	40	1998	39 000	1999	N/A	N/A	N/A	N/A
Rwanda	7235	1350	1997	400 000	1999	N/A	N/A	N/A	N/A
Sierra Leone	4717	26	1998	68 000	1999	N/A	N/A	N/A	N/A
Somalia	9672	5	1990	N/A	N/A	N/A	N/A	N/A	N/A
Sudan	28 883	392	1999	140 000 ^d	1999	1 ^e	1995	18.9	1995
Botswana ^f	1597	2992	1999	290 000	1999	80	1996	85.0 ^e	1996

^a Data Source: UNAIDS Epidemiological Fact Sheet on HIV/AIDS and sexually transmitted infections, 2000 update

(<http://www.unaids.org/hivaidsinfo/statistics/june00/fact-sheets/pdfs/>). ^b Knowledge of HIV-related preventive practices, proportion of people citing at least two acceptable protection methods. ^c Proportion people reporting the use of a condom during most recent intercourse of risk.

^d Adult population only; adult defined as 15–49 years of age. ^e Female respondents only, otherwise male and female respondents were combined.

^f Botswana included for comparison as a sub-Saharan African country not affected by a complex emergency in the 1990s.

N/A, no data available, otherwise last year reported is included; DRC, Democratic Republic of Congo.

Inadequately resourced and poorly functioning national AIDS control programs (NACPs) in countries affected by complex emergencies can rarely meet HIV surveillance or other program requirements. For example, according to the joint United Nations Programme on HIV/AIDS (UNAIDS) country profiles (which use data collated by the US Bureau of the Census) for Sierra Leone, antenatal HIV seroprevalence data have not been reported since 1992 [17]. In southern Sudan, largely controlled by the rebel Sudanese People's Liberation Army (SLPA), data on the HIV epidemic do not appear to exist. The absence of data quantifying the magnitude of the HIV epidemic and providing a baseline against which to evaluate programs has made it difficult for donors and non-government organizations (NGOs) providing health services in many of these situations to give HIV prevention programs a high priority. In addition, the international public health community has, in general, been reluctant to invest in communicable disease surveillance in countries affected by complex emergencies. This position ignores the long-term and fluctuating nature of many complex emergencies and the opportunities to conduct surveillance in relatively stable regions (e.g. capital cities and urban centers) of otherwise politically unstable countries.

Even in countries with well-resourced and well-functioning NACPs, HIV surveillance data for forced-migrant populations are poor. The NACPs do not generally view refugee health programs as within their scope of activities because UNHCR is officially responsible for the welfare of these populations. Large-scale internal displacement within a country is usually due to active civil conflict, and the ministry of health (and the NACP) may not see HIV surveillance and prevention as a priority under such circumstances. UNHCR has no official mandate to provide assistance to internally displaced persons. Forced-migrant populations, who are often members of ethnic minorities, rural populations or otherwise politically and economically marginalized groups, may not have had equitable access to health program resources prior to migration and are unlikely to have a political voice. For example, in two developing countries that are often viewed as models of best

practice in HIV surveillance and prevention, Uganda and Thailand, virtually no data exist about the HIV status of their large forced-migrant populations. At the end of 1998, Uganda had an estimated 400 000 internally displaced persons and hosted 185 000 refugees: 170 000 from Sudan, 7000 from Rwanda, 6000 from Congo, and 2000 from Somalia. In addition 12 000 Ugandans were refugees in surrounding countries [9]. Thailand hosted nearly 188 000 refugees, mostly from Burma, Cambodia, and Laos. An additional 350 000 Burmese are reportedly to be living in Thailand on a transient basis [9].

Second generation HIV surveillance in complex emergencies

Second generation surveillance techniques such as population-based surveys and the collection of data from secondary sources may provide the only useful information in these settings [18]. Such secondary source data include: seroprevalence data from the country of origin and the host country if available; proxy indicators, such as new cases of tuberculosis and STIs from health service providers (see Box 1); and blood bank data on HIV and syphilis prevalence. However, in addition to varying donor recruitment practices and the inherent biases, data from blood-bank HIV screening in host country hospitals or from diagnostic testing in health facilities are often not disaggregated by refugee/indigenous status and are rarely systematically gathered and analyzed.

Box 1: the use of secondary sources: Eastern Ethiopia/Somaliland 1997 (see Fig 1)

In August 1997, the United Nations High Commissioner for Refugees (UNHCR) conducted an assessment of the HIV/AIDS situation in eastern Ethiopia and the Somaliland region of Somalia. The objective was to gain an understanding of the magnitude of the HIV epidemic and the effect of the 280 000 refugees from Somaliland on the evolving epidemic in the region.

The town of Jijiga, the largest in the Somali region of Ethiopia, had become a central point for commerce in the region. It is located on the major transport route between Addis Ababa, the capital of Ethiopia and Hargeisa, the major city in Somaliland, and is close to the refugee settlements. The seven refugee camps nearby had become focal points for cross-border population movement, which was facilitated by the common Hamitic ethnic origin of the Somali populations on both sides of the border. There were large populations of truck drivers, military personnel, and commercial sex workers (CSWs) in the town. There was also widespread social and sexual mixing between the Muslim Somali population, including refugees, and the Christian Ethiopian highland population. In addition, across the border in Somaliland, there were approximately 25 000 recently demobilized soldiers and massive disruption to social networks because of the war; approximately 40% of households were female-headed (UNHCR data).

The 3-week assessment involved collecting available secondary source data and interviewing key informants. Informants included representatives of the joint United Nations Programme on HIV/AIDS (UNAIDS), UNHCR, international non-government organizations, public health officials, blood bank staff in both countries, health workers in refugee camps, refugee leaders, and CSWs.

In Ethiopia, the HIV epidemic was rapidly progressing: seroprevalence rates in Addis Ababa were 15% among antenatal women, 70% among CSWs, and 7% among blood donors. Substantial evidence indicated the epidemic was not confined to the capital (UNAIDS data) but no HIV surveillance system was in place in the Somali region of Ethiopia. In Somalia, where the health system had collapsed because of civil war, the official reported number of cumulative AIDS cases to 1995 was 13 for the entire country. This figure was likely to represent a gross under-estimate. Another estimate put HIV prevalence rates at 20/10 000 (Institute of Social and Preventative Medicine, Zurich). No official HIV prevalence data were reported for the relatively politically stable province of Somaliland.

On either side of the border, testing for HIV was conducted only:

- to screen blood before transfusion;
- to confirm a diagnosis in a patient with suspected AIDS; and
- to screen patients before surgery.

Consent was not generally obtained for testing and patients were not told of the test results. Testing in both regions was performed with the HIV spot test or Capillus as enzyme immunoassay testing was not available.

AIDS cases had not been reported from the refugee camps in Ethiopia, although individual patients meeting clinical case definitions were identified in camp clinics during the assessments. A total of 109 AIDS cases were reported from Hargeisa hospital between June 1995 and August 1997; 65% were male aged 20–50 years. Mother-to-child transmission accounted for 3% of cases. Contrary to popular stereotypes, most patients were married and of Somali ethnic origin (i.e. not foreigners). The most frequent occupations in descending order were soldiers (or ex-soldiers), truck drivers, housewives, and unemployed persons.

Blood bank data from major hospitals in Somaliland showed an HIV seroprevalence rate of 1% ($n = 2500$), whereas Jijiga hospital reported a rate of 17.8% in 1995–1996 ($n = 146$). Syphilis seropositivity rates in voluntary blood donors in Somaliland varied from 5% to 10%. Extrapolation from previous estimates and blood bank data to the general population in Somaliland, yielded an estimate of 3000–15 000 HIV infections in 1997.

This assessment highlighted the potential for a rapid increase in HIV seroprevalence in the region on both sides of the border because of a combination of factors, including population movements, social disruption associated with war, high rates of STIs, and high rates of HIV among Ethiopian CSWs. Recommendations emphasized the opportunity to prevent progression of the HIV epidemic in Somaliland and the development of a cross-border HIV prevention program targeting truck-drivers, soldiers, CSWs, and refugees.



Fig. 1. Map of Ethiopia and Somaliland showing major sites of assessment described in Box 1.

Population-based surveys may provide critical and timely data on population HIV serostatus (see Box 2) in these situations. Repeated surveys may form the basis of the surveillance system and may also be used to validate the results of any sentinel surveillance occurring at ANC clinics. These techniques require less precise information on overall population size, will not require a functioning health system, and will enable the rapid estimation of HIV seroprevalence in the general population. Furthermore such techniques may be used to estimate seroprevalence in 'hard-to-reach' populations such as commercial sex workers, intravenous drug users, and military or para-military personnel.

Box 2: conducting an HIV/STI cross-sectional prevalence study among Sudanese refugees, Western Ethiopia, 1992¹

Between June and October 1992, the Centers for Disease Control and Prevention (CDC) conducted a cross-sectional survey to establish baseline prevalence rates of HIV and sexually transmitted diseases (STIs) among Sudanese refugees, commercial sex workers (CSWs), and antenatal clinic attendees in the Keffa region of Ethiopia. A 'knowledge, attitudes, behavior and practices' survey was also performed. It represented the first stage in the development of a joint project in STI/HIV control and prevention established by CDC and the Ministry of Health of Ethiopia.

The site of the project was the Dimma refugee camp and two neighboring towns of Fandika and Aman. The region is ethnically diverse, comprising Nuer, Anuak, Bench, and other groups. Many itinerant workers, gold miners, and vendors as well as 300 registered CSWs resided temporarily in Fandika. The refugees in Dimma camp were also predominantly of Nuer and Anuak ethnicity, and the male:female ratio was 3 : 1.

Knowledge of and attitudes toward condom use were assessed using focus groups and surveys among CSWs, students, and refugee men. A serologic survey was conducted among convenience samples of refugee men, refugee and Ethiopian antenatal clinic attendees, and Ethiopian CSWs to detect and treat syphilis. To determine the prevalence of other STIs, all personal identifiers were removed, and specimens were tested for herpes simplex virus-2 (HSV-2), chancroid, and HIV. Testing was voluntary, and informed consent was obtained verbally.

Sex with a CSW in the previous 3 months was reported by almost one-third of refugee men. Most refugee men reported difficulties in obtaining condoms. Approximately two-thirds of CSWs but no refugee women reported ever having used a condom.

HIV seroprevalence was highest in the CSWs (approximately 40%). The prevalence in Sudanese refugee men over 21 years of age was similar to that in Ethiopian antenatal clinic attendees (approximately 5%). None of the Sudanese refugee women at the antenatal clinic tested positive for HIV. Refugee men aged 20–24 years, had the highest HIV seroprevalence rates. Syphilis, chancroid, and HSV-2 were also common in all groups. There was a positive association between HIV and HSV-2 serology.

This assessment established baseline estimates of the population's health knowledge, as well as HIV/STI prevalence rates, against which the effectiveness of a HIV/STI prevention program could be evaluated. The absence of HIV in the refugee antenatal clinic group highlighted the need for methods of HIV surveillance that were not clinic-based. Young males were identified as a vulnerable target group and specific interventions were identified.

¹ Information derived from situation assessment for STIs/HIV among Sudanese refugees in Western Ethiopia carried out by the International Program Office at CDC [24].

The objective of HIV surveillance in complex emergencies may initially be to collect data on the highest risk subsections of the population rather than from the entire population. In these settings, household surveys could over-sample particular demographic groups determined to be at greater risk for HIV or whose prevalence rates may more accurately reflect HIV incidence rates, such as women in the 15-24 years age group [16]. Cluster surveys are frequently used in forced-migrant populations to determine vaccination coverage or malnutrition prevalence rates and have recently been adapted for use in determining STI prevalence [19]. Cluster surveys can be repeated to assess trends in prevalence rates. Although the estimation of denominators remains a difficult issue in interpreting survey data in most mobile populations, the humanitarian sector has gathered significant experience with cluster-survey methods, which can provide

valid results even in the absence of precise population sampling frames. Moreover, population mapping techniques have recently improved and spatial sampling techniques may prove extremely useful in emergencies [20,21].

STI prevalence data, collected by testing urinary samples for gonorrhea and chlamydia, could be gathered in conjunction with HIV data in such population-based surveys. Ideally, an intervention, such as the follow-up and treatment of STIs, could be linked to the survey. HIV testing could be performed with serum, dried blood spot, urine, or salivary samples using a voluntary, anonymous unlinked approach with the simultaneous provision of separate voluntary counseling and testing for those who wish to know their results. Alternatively, testing could be voluntary and confidential; same-day testing and counseling may be possible with newer, rapid testing techniques. In many settings, significant resources will need to be invested in voluntary counseling and testing prior to the survey [22]. NGOs, which are the major health providers in most complex emergencies, could perform such surveys as a first stage of their HIV prevention and treatment programs. Health clinics operated by NGOs may provide suitable access points for population subgroups that are otherwise difficult to access. Regular national, NGO health staff could serve as members of the survey teams and assist survey co-ordinators in developing sampling frames, performing sampling and recruiting participants. Training in the design, completion, transportation, and storage of questionnaires, and the proper labeling, handling and storing of specimens, will be essential to ensure that confidentiality is not breached. In the future, techniques, such as the 'detuned' assay, may provide estimates of age-specific incidence rates of HIV infection [23]. Incidence measures would be particularly useful immediately after a prolonged emergency or war, where seroprevalence data may not have been collected for several years, and current epidemic trends are unclear.

In most circumstances, detailed information about risk behaviors should not be collected during the seroprevalence survey as anonymity is harder to guarantee and participation rates may decrease. Cross-sectional behavioral surveillance of the general population and specific sub-populations identified as vulnerable should be conducted separately and will provide important complimentary data for interpreting seroprevalence trends, identifying potentially high risk populations, and designing interventions. Behavioral surveys should collect the standard data as described in UNAIDS/Family Health International instruments but will also need to collect information on specific risk factors relevant to the particular complex emergency.

Conclusion

"With major movements of populations between countries in every continent we can no longer ignore the opportunities afforded to further HIV transmission by the break up of communities previously protected by geography, social cohesion and demographic factors." (Hawkes et al., 1993 [25].)

Important ethical and political concerns must be taken into account before implementation of surveillance systems for HIV and other STIs in already marginalized populations, such as forced migrants. Confidentiality may be more difficult to guarantee in a refugee camp, leading to the risk of further stigmatization. The potential exists for misuse of information by governments on an individual or population basis and for discrimination against forced migrants. Informed consent in combination with the active participation of community members in the design of the system remain the key safeguards.

Forced migrants represent an important subgroup not adequately addressed by HIV surveillance or prevention programs. Surveillance for HIV is a key mechanism for defining the extent of the epidemic in these situations and identifying risk factors to provide a rational basis for designing HIV prevention strategies. Alternative assessment and surveillance methods to characterize the epidemic, such as serial, cross-sectional, population-based studies, need to be developed and validated for situations in which the regular infrastructure is not present. Preventing HIV in these settings has implications, not only for the populations immediately affected, but also for the regional control of HIV/AIDS epidemics. Although UNHCR may have a role to play in refugee settings, there is an urgent need for an international agency with a technical mandate, such as the World Health Organization, to take the lead in promoting and co-ordinating these activities in countries affected by complex emergencies, particularly those in which there are a large number of internally displaced persons. Such surveillance activities are an essential component of HIV and STI programs and should be integrated with existing reproductive health programs implemented by NGOs.

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References

1. Decosas J, Kane F, Anarfi JK, Sodji KD, Wagner HU. Migration and AIDS. *Lancet* 1995, 346:826-828.
2. Nelson KE, Celentano DD, Eiumtrakol S, et al. Changes in sexual behavior and a decline in HIV infection among young men in Thailand [see comments]. *N Engl J Med* 1996, 335:297-303.
3. Toole MJ, Waldman RJ. Prevention of excess mortality in refugee and displaced populations in developing countries. *JAMA* 1990, 263:3296-3302.
4. UNHCR. Convention and Protocol Relating to the Status of Refugees. Geneva, Switzerland: United Nations High Commissioner for Refugees; 1968: Publication HCR/INF/29/Rev 23.
5. Gras MJ, Weide JF, Langendam MW, Coutinho RA, van den Hoek A. HIV prevalence, sexual risk behaviour and sexual mixing patterns among migrants in Amsterdam, The Netherlands. *AIDS* 1999, 13:1953-1962.
6. Pison G, Le Guenno B, Lagarde E, Enel C, Seck C. Seasonal migration: a risk factor for HIV infection in rural Senegal. *J Acquir Immune Defic Syndr* 1993, 6:196-200.
7. Kane F, Alary M, Ndoye I, et al. Temporary expatriation is related to HIV-1 infection in rural Senegal. *AIDS* 1993, 7: 1261-1265.
8. Nunn AJ, Kamali A, Kengeya-Kayondo JF, Mulder DW. Migration and HIV-1 seroprevalence in a rural Ugandan population. X International Conference on AIDS. Yokohama, August 1994 [abstract no. PC0040].
9. US Committee for Refugees. World Refugee Survey. Washington: US Committee for Refugees; 1999.
10. UNHCR/WHO/UNFPA. Inter-agency Field Manual. Repro-ductive Health in Refugee Situations. Geneva; UNHCR/WHO/UNFPA; 1999.
11. Khaw AJ, Salama P, Burkholder B, Dondero T. HIV risk and prevention in emergency-affected populations. *Disasters* 2000, 24: 181-197.
12. Mabey D, Mayaud P. Sexually transmitted diseases in mobile populations. [Review] [33 refs]. *Genitourin Med* 1997, 73:18-22.
13. Salama P. Report of a HIV/AIDS situational analysis in eastern Ethiopia and Somahland. Geneva: UNHCR; 1997:1-20.
14. Harrell-Bond B. Pitch the tents. An alternative to refugee camps. *New Republic* 1994:15-19.
15. USAID. Kosovo fact sheet 72. USAID; 1999. http://www.info.usaid.gov/hum_response/ofda/kosofs72.html .
16. UNAIDS. Trends in HIV incidence and prevalence. In: Geneva: UNAIDS; 1999. <http://www.unaids.org>
17. UNAIDS/WHO. Epidemiological fact sheet, Sierra Leone. Geneva: UNAIDS/WHO, 1998. http://www.unaids.org/hivaidinfo/statistics/june98/fact_sheets/all_countries.html 1998,#S.
18. UNAIDS/WHO. Guidelines for second generation HIV surveillance. Geneva: UNAIDS/WHO; 2000:1-48.

19. Mayaud P, Msuya W, Todd J, et al. STD rapid assessment in Rwandan refugee camps in Tanzania. *Genitourin Med* 1997, 73:33-38.
20. Stern A. International population movements and public health in the Mekong region: an overview of some issues concerning mapping. *SE Asian J Trop Med Public Health* 1998, 29:201-212.
21. Roberts L, Despines M. Mortality in the Democratic Republic of the Congo [letter]. *Lancet* 1999, 353:2249-2250.
22. WHO. The importance of simple/rapid assays in HIV testing.. *Wkly Epidemiol Rec* 1998, 73:321-328.
23. Janssen RS, Satten GA, Stramer SL, et al. New testing strategy to detect early HIV-1 infection for use in incidence estimates and for clinical and prevention purposes. *JAMA* 1998, 280:42-48. [published erratum appears in *JAMA* 1999, 281(20):1893].
24. Young Holt B, Effler P, Brady W, et al. Report on the STI/HIV situation among Sudanese refugees in Keffa region, Ethiopia. Atlanta, GA: CDC, 1992.
25. Hawkes SJ, Hart GJ. Travel, migration and HIV. *AIDS Care* 1993, 5:207-214.

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