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The Epidemiology of AIDS and HIV Infection in Costa Rica[1]

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This article describes and assesses the epidemiology of AIDS and HIV infection in Costa Rica. A total of 283 AIDS cases were reported in the country between 1983, when the first cases were diagnosed, and the end of August 1991. This placed Costa Rica third among the seven Central American countries—both in terms of cumulative AIDS incidence and the cumulative number of cases.

Despite a continued small number of hemophilia and transfusion-associated AIDS cases, screening of blood and blood products has provided a high degree of safety for the blood supply.

The high male:female ratios of reported AIDS cases (11:1) and HIV infections (14:1) and the high proportion of AIDS cases (72%) transmitted by male-to-male sexual contact give grounds for considering Costa Rica to be a Pattern I country—one where the disease is transmitted primarily among homosexual/bisexual males. However, increasing numbers of heterosexual and perinatal cases, high rates of HIV infection among pregnant women, and existing patterns of bisexuality are consistent with a possible shift toward a Pattern I/II epidemic.

The purpose of this article is to briefly describe and assess the AIDS epidemic in Costa Rica. The earliest HIV transmission in Costa Rica probably occurred during the late 1970s or early 1980s. As of the end of August 1991, 283 AIDS cases had been diagnosed and reported to the Ministry of Health of Costa Rica.

During the first years of the epidemic, the HIV transmission dynamics observed in Costa Rica resembled those found in Western industrial (Pattern I) countries. According to the World Health Organization's definition of global epidemiologic AIDS patterns, Pattern I countries are characterized by early and continued HIV transmission primarily among homosexual/bisexual men. During the earliest years of the epidemic in such countries, the male-to-female AIDS case ratio is commonly in the range of 10:1 to 15:1 (*1*).

Through August 1991, the male:female AIDS case ratio recorded in Costa Rica was 11:1, a ratio consistent with the classic Pattern I definition. However, indicators suggesting a possible shift toward Pattern I/II transmission also existed. These included small but increasing numbers of heterosexual and perinatal cases, together with a 0.4% HIV infection rate among pregnant women in a major

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serosurveillance study. Prevalent bisexuality could promote such a shift, as could increased HIV infection rates among female prostitutes (a major epidemic feature in nearby Honduras—2).

METHODS

The AIDS case surveillance data and HIV seroprevalence data reported here were obtained from the Ministry of Health's Department of AIDS Control and Prevention in San José. Most Costa Rican AIDS cases meet the AIDS case definition published by the United States Centers for Disease Control (CDC) in 1987 (3). Use of the slightly broader PAHO revised ("Caracas") definition adds several more cases (4). For serosurveillance purposes, the presence of HIV infection is determined by a repeatedly positive enzyme-linked immunosorbent assay (ELISA) for HIV antibody with Western blot confirmation. Since February 1988 AIDS has been included on the list of communicable diseases for which notification is mandatory in Costa Rica.

Costa Rica's epidemiologic surveillance system operates on three levels termed local, regional, and central. The local level receives initial reports of suspected AIDS cases, conducts active case-finding, and collects blood samples from suspected cases. These blood samples, together with reports on suspected cases, are then forwarded to the regional level, where the clinical diagnosis is validated and initial HIV serologic tests (ELISA) are performed on the blood samples. The regional level in turn relays positive specimens to the central level for confirmatory Western blot serologic testing. Besides performing these confirmatory HIV tests at the AIDS National Reference Laboratory, the central level distributes notification forms to all levels; compiles the complete clinical history of each AIDS patient; processes, analyzes, and tabulates all AIDS epidemiologic data; and provides AIDS surveillance summaries to PAHO.

RESULTS

AIDS Cases

Of the 283 people with AIDS reported to the Ministry of Health through August 1991, 183 (65%) were known to have died. These 283 cases in a national population of 3.0 million people made the cumulative incidence 9.3 cases per 100 000 (Table 1), slightly above the cumulative Central American incidence of 8.4 cases per 100 000. Seventy-seven of the 283 reported cases occurred in 1990, yielding an annual incidence for that year of 2.5 cases per 100 000.

Table 1. Cumulative reported AIDS cases and AIDS incidence in Central America through 15 August 1991, by country.

Country	Cumulative number of AIDS cases	Rank	Population	Cumulative incidence	Rank
Belize	12	6	180 400	6.7	5
Costa Rica	283	3	3 032 000	9.3	3
El Salvador	370	2	5 221 000	7.1	4
Guatemala	176	5	9 340 000	1.9	6
Honduras	1 306	1	5 261 000	24.8	1
Nicaragua	16	7	3 606 000	0.4	7
Panama	280	4	2 423 000	11.6	2
Total	2 443		29 063 400	8.4	

Among the seven Central American countries, Costa Rica ranked third in terms of the cumulative numbers of reported AIDS cases, having about the same number of cases as Panama (280) but less than El Salvador (370) or Honduras (1 306) (5). With regard to cumulative incidence, Costa Rica's 9.3 cases per 100 000 population ranked third behind Panama (11.5) and Honduras (24.8) (Table 1).

Geographic Patterns

The Costa Rican AIDS epidemic is concentrated within metropolitan areas of the Central Valley. The capital city, San José (population: 1 117 636), with 37% of the national population, had the largest number of AIDS cases (183 cases, 65%). Three other Central Valley cities reporting significant numbers of cases were Alajuela (population 545 554, 29 cases), Cartago (population 344 160, 26 cases), and Heredia (population 246 331, 27 cases). Only 18 cases (6% of the total) were reported from other parts of Costa Rica.

Time Trends

The first AIDS case was reported in 1983; thereafter, the number of reported cases increased in each successive year (as noted above, 77 cases were reported in 1990). At first the numbers of reported cases about doubled annually, but the numbers were very small. Since 1988 the rate of increase has slowed considerably (Table 2).

The earliest AIDS cases in Costa Rica occurred among men with hemophilia, who accounted for all the cases in 1983 and 1984 (three each year) and for three of the six cases in 1985. From 1985 through 1990, homosexual or bisexual subjects accounted for 50% to 79% of the cases in each year. Several years into the epidemic, the first AIDS patients were diagnosed from such additional exposure categories as blood transfusion, injection drug use (IDU), and perinatal transmission (Table 2).

Sex and Age

Nearly all (260, 92%) of the 283 reported AIDS cases have occurred in males (Table 3), making the male:female cumulative AIDS case ratio 11:1 as of August 1991. Since 1988, however, the proportion of female cases has increased slightly as female cases have been reported in the blood transfusion, hetero-

Table 2. AIDS cases in Costa Rica by exposure category and year of diagnosis.

Exposure category	Year of diagnosis									
	83	84	85	86	87	88	89	90	91[a]	Total
Homosexual	—	—	3	5	17	33	33	41	34	166
Bisexual	—	—	—	1	2	7	8	13	8	39
Heterosexual	—	—	—	1	—	3	5	4	3	16
Hemophilia	3	3	3	3	4	5	1	4	1	27
Blood transfusion	—	—	—	1	—	—	2	4	2	9
IDU	—	—	—	—	—	1	1	5	—	6
Perinatal	—	—	—	—	—	1	3	3	—	7
Unknown	—	—	—	—	1	2	2	3	4	13
Total	3	3	6	11	24	52	55	77	52	283

[a]1 January through 15 August 1991.

Table 3. Reported cases of HIV infection in Costa Rica by exposure category and sex, through 15 August 1991.

Exposure category	Male	Female	Total
Homosexual	166	—	166
Bisexual	39	—	39
Heterosexual	6	10	16
Hemophilia	27	—	27
Blood transfusion	3	6	9
IDU	5	1	6
Perinatal	1	6	7
Unknown	13	—	13
Total	260	23	283

sexual contact, and perinatal transmission categories.

Six pediatric AIDS cases were reported in children less than 5 years old at the time of diagnosis, and seven more were reported in children 5 through 12. Forty-three AIDS cases (15%) were diagnosed in persons 13–24 years old, 199 (70%) in persons 25–44 years old, and 28 (10%) in persons over 44.

Exposure Categories

Sexual transmission. Of the 283 AIDS cases, 221 (78%) were classified as involving sexual transmission. Most of the cases (166, 58%) occurred in men who reported a history of homosexual contact (Tables 2 and 3). An additional 39 cases (14%) occurring in men have been classified as bisexual contact cases. Thus, male-to-male sexual contact was a primary risk behavior reported for 72% of all the subjects with AIDS and 79% of the 260 male AIDS patients. Heterosexual contact accounted for 16 cases (6%), with 10 of these 16 cases afflicting women (Table 3).

Transfusion-associated transmission. Twenty-seven cases (10%) occurred in people with hemophilia who received HIV-contaminated clotting factor products. Nine cases (3%) occurred in people who received an HIV-contaminated homologous blood transfusion. Combining these two categories, receipt of HIV-contaminated blood and blood products accounted for 36 (13%) of the 283 reported cases.

Perinatal transmission. Seven AIDS cases resulted from mother-to-child transmission during the perinatal period. The other six pediatric AIDS cases (birth through age 12) occurred in children who had received HIV-contaminated blood or anti-hemophilic factor products. Costa Rican surveillance data classify these six latter cases among the blood-borne transmission cases described above.

HIV Seroprevalence Data

Through August 1991, the Ministry of Health's Department of AIDS Control and Prevention had received 568 reports of cases of HIV infection. Of these, 38 (7%) were found in females, yielding a male:female ratio of 14:1.

The Ministry of Health has conducted seroepidemiologic studies to monitor levels of HIV infection, including both population-based studies (among blood donors) and sentinel surveillance studies (among patients at STD and tuberculosis clinics, pregnant women at prenatal clinics, clients attending HIV counseling and testing sites, health center clients, and residents of a slum area) (Table 4). The highest rate of HIV infection found by these studies was reported among clients attending HIV testing sites (14.5%).

DISCUSSION AND CONCLUSIONS

The AIDS epidemic in Costa Rica has become increasingly diverse, with cases classified into more exposure categories

Table 4. HIV antibody seroprevalences in selected Costa Rican populations, 1985–1990.

Population	Dates	Sample size	No. sero-positive	Prevalence (%)
Blood donors	Oct 85–Oct 87	80 000	24	0.03
Blood donors	1988	34 452	18	0.05
Prostitutes from STD clinics	Aug 90–Feb 90	765	15	1.96
Patients from TB clinics	Oct 89–Aug 90	3 008	66	2.19
Pregnant women	Jul, Aug, Sep 90	1 244	5	0.40
General public at health center	Oct 89–Oct 90	1 147	9	0.78
Patients from HIV testing site	Jul 90–Nov 90	200	29	14.50
General public from slum site	Jul, Aug, Sep 90	3 917	8	0.20

over time. Clearly, sexual transmission predominates, with male-to-male sexual contact constituting the primary risk behavior.

Superficially, within the framework that WHO uses to classify global AIDS epidemiology, this picture seems typical of classic Pattern I transmission (*1*). Specifically, the Costa Rican AIDS epidemic appears to diverge from those epidemics in neighboring Central American nations that exhibit Pattern I/II characteristics, as exemplified by a progressive shift toward heterosexual contact cases (2). It is true that heterosexual contact cases have emerged recently in Costa Rica, but homosexual and bisexual contact remained the predominant exposure categories through midyear 1991.

On the other hand, several indicators suggest that the AIDS scourge in Costa Rica may ultimately become a Pattern I/II epidemic. These indicators, which point out a potential for increased heterosexual spread of HIV, include (1) increasing reports of heterosexual cases in recent years, (2) recent reports of perinatal cases, (3) moderate levels of HIV infection among prostitutes tested at STD clinics, and (4) unexpectedly high rates of HIV infection among pregnant women seeking prenatal care.

It should also be noted that bisexuality is institutionalized in Costa Rica because overt expression of male-to-male sexual preference is proscribed, and bisexuality can serve as a potential bridge for infection of female sexual partners and their unborn children. Within this context, prevailing rates of other sexually transmitted diseases are high enough to potentiate heterosexual spread of HIV. Also, rates of HIV infection in female prostitutes, still quite low in Costa Rica, have grown explosively elsewhere (notably in Honduras) and could increase the number of female cases (2).

The number of injection drug users (IDUs) in Costa Rica is very small, and therefore IDU-related transmission of HIV is uncommon. In addition, implementation of HIV testing, adoption of public health measures directed toward enhancing the safety of blood collected for homologous transfusion, and use of manufacturing processes designed to ensure the safety of clotting factor products imported primarily from the United States

have diminished the chances of bloodborne HIV transmission.

Overall, however, data from seroepidemiologic studies have raised concerns about the epidemic's future dynamics. First, even acknowledging the effect of self-selection among people who seek HIV testing, the 15% HIV seroprevalence rate among HIV counseling and testing site clients is alarming (and considerably higher than rates found at many testing sites in the United States). The rate of 0.8% found among general public health center clients is also noteworthy. In addition, regarding HIV infection in women, the finding of a 2% HIV infection rate among female prostitutes attending STD clinics, coupled with a 0.4% HIV infection rate among pregnant women, suggests that women are at risk and will increasingly contribute to the expanding epidemic.

For the future, important measures include establishing a multidisciplinary task force to address such public health issues as access to medical care, cost-effectiveness of AIDS programs, psychosocial impacts of AIDS-related diseases among certain social groups, collaboration between AIDS and STD prevention efforts (6), and legislation to ensure the confidentiality of HIV/AIDS data. Of course, in addition to prevention initiatives coming from the Ministry of Health, the course of the AIDS epidemic in Costa Rica will depend on a broad array of social, cultural, and moral values and traditions; and confronting the epidemic will require implementation and ongoing evaluation of multiple programs targeted toward specific risk behaviors (7). Linkages to global AIDS prevention efforts will be essential.

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