Epidemiology of AIDS and HIV Infection in the Caribbean

JAI P. NARAIN,[1] B. HULL,[1] C. J. HOSPEDALES,[1] S. MAHABIR,[1] & D. C. BASSETT[1]

♦♦♦

A review of surveillance data on AIDS and HIV infection in the 18 English-speaking Caribbean countries and Suriname suggests that the epidemiologic pattern of AIDS in the Caribbean is evolving from an epidemic that began in 1983 among homosexual and bisexual males to one in which cases are increasingly resulting from heterosexual contact, with different countries at various stages of transition. Overall, there has been a decline in the male to female case ratio. Perinatal transmission is already a major problem in many countries—19% of cases in the Bahamas are among children under 15 years of age. Serosurveys conducted in Trinidad and Tobago, Jamaica, Antigua, St. Vincent and the Grenadines, and other countries show high HIV seroprevalence among homosexuals (15–40%), prisoners (4–10%), prostitutes (up to 13%), and cocaine users (2%); at present, prevalence in the general population continues to be low.

Since the first case was reported in the United States in 1981, cases of acquired immunodeficiency syndrome (AIDS) have been reported in increasing numbers from almost all parts of the world, including the Caribbean countries. An estimated 5–10 million persons worldwide are likely to be infected with human immunodeficiency virus (HIV), the causative agent of AIDS (*1*). In the Americas, which reports the majority of the world's AIDS cases, five countries—the United States of America, Brazil, Canada, Haiti, and Mexico—account for 95% of all reported cases (*2*). The data also demonstrate that the entire Caribbean area has exceptionally high rates of AIDS. This paper describes the magnitude of AIDS and HIV infection in 18 English-speaking Caribbean countries and Suriname, and discusses the implications of the changing epidemiologic pattern of the disease in this area.

[1]Caribbean Epidemiology Center, P.O. Box 164, Port of Spain, Trinidad and Tobago.

BACKGROUND

Since its inception in 1975, the Caribbean Epidemiology Center (CAREC) has collected and analyzed communicable-disease surveillance data from its 19 member countries: Anguilla, Antigua and Barbuda, Bahamas, Barbados, Belize, Bermuda, the British Virgin Islands, the Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts and Nevis, Saint Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, and the Turks and Caicos Islands. These countries have a combined population of 6.3 million people and share a similar colonial history and similar problems, especially in health.

AIDS surveillance in the area began in 1982; since 1985, the countries routinely have reported AIDS cases to CAREC, using a standard PAHO/WHO form. HIV antibody testing began in the Caribbean in 1985, first in Trinidad and Tobago and subsequently in many other countries. As of August 1988, almost all the 19

countries and territories had already acquired HIV antibody testing equipment and supplies, and their technicians had been trained with CAREC assistance.

METHODS

We reviewed and analyzed data on AIDS cases from the 19 Caribbean countries which have been reporting cases on a quarterly basis to CAREC in Port of Spain, Trinidad. A standard reporting form is used, and it provides information on distribution of cases according to age, sex, and transmission category.

The countries also report the number of HIV tests performed on donated blood and the number of tests performed for diagnostic purposes. Information on HIV infection in specific population groups was gathered through various surveys and studies conducted in different countries, most of which are still unpublished.

For the purpose of surveillance and for reporting to CAREC, a positive serologic test is defined as a repeatedly reactive antibody test with ELISA, followed by a positive confirmation test with Western blot assay. The WHO/PAHO AIDS case definition is used by all the reporting countries.

RESULTS

The first confirmed case of AIDS in the Caribbean occurred in Jamaica in 1982. In Trinidad and Tobago, eight cases were reported in 1983—all in homosexual or bisexual males.

As of 30 June 1988, the CAREC member countries had reported 827 cases, 80% of which were reported since January 1986 (Table 1). The number of reported cases was 187 for 1986 and 306 for 1987, representing an increase of 63%. Of the 827 total cases, 492 had died, giving an overall case fatality ratio of 59.4%.

Nearly 90% of the cases were reported from five countries—Trinidad and Tobago, Bahamas, Bermuda, Barbados, and

Table 1. Reported cases by year and country as of 30 June 1988.

	Year							
Country	1982	1983	1984	1985	1986	1987	1988[a]	Total
Anguilla	—	—	—	—	2	—	1	3
Antigua	—	—	—	—	2	1	0	3
Bahamas	—	—	—	36	50	90	38	214
Barbados	—	—	2	9	20	24	8	63
Belize	—	—	—	—	1	7	0	8
Bermuda	—	—	—	30	21	21	3	75
British Virgin Is.	—	—	—	—	—	—	—	0
Cayman Is.	—	—	—	1	1	1	1	4
Dominica	—	—	—	—	—	5	1	6
Grenada	—	—	—	2	1	5	3	11
Guyana	—	—	—	—	—	12	20	32
Jamaica	1	0	1	4	6	33	17	62
Montserrat	—	—	—	—	—	—	—	0
St. Kitts and Nevis	—	—	—	—	—	1	—	1
Saint Lucia	—	—	—	4	0	7	0	11
St. Vincent and the Grenadines	—	—	1	0	2	6	3	12
Suriname	—	—	—	—	2	5	1	8
Trinidad and Tobago	—	8	19	45	77	86	75	310
Turks and Caicos Is.	—	—	—	—	2	2	—	4
Total	1	8	23	131	187	306	171	827

[a]Data for first six months only.

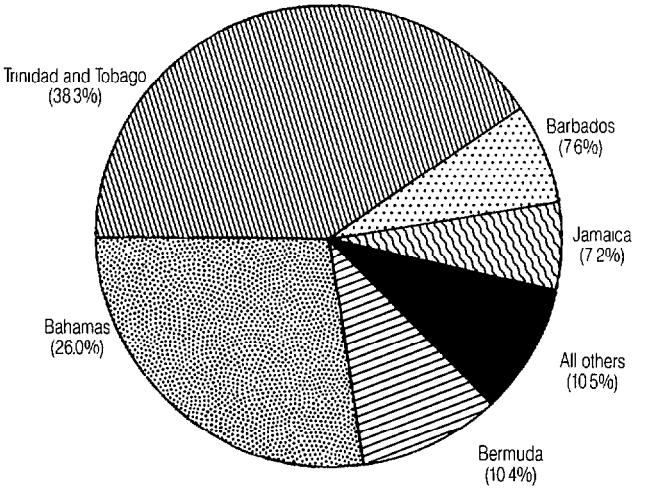

Figure 1. Distribution by country of reported AIDS cases among CAREC member countries, as of 30 June 1988.

Jamaica; 75% were from the first three countries (Figure 1).

The distribution of cumulative cases and of deaths in selected countries were as follows: Trinidad and Tobago, 310 cases and 200 deaths; Bahamas, 214 and 104; Bermuda, 75 and 58; Barbados, 63 and 43; and Jamaica, 62 and 38. In Guyana, the first 12 cases were reported in 1987; up to June in 1988, 20 additional cases had been reported. Similarly, Jamaica reported six cases in 1986 and 33 in 1987. Montserrat and the British Virgin Islands are the only two territories in the Americas that have not reported any AIDS cases to date. The annual incidence rates of reported cases in some Caribbean countries are among the highest in the world. During 1987, the rates per 100,000 population varied from 0 to 38.3, median 4.27. Countries with high rates were Bahamas (38.3), Bermuda (35.3), Barbados (9.4), and Trinidad and Tobago (7.0) (Table 2). Of the five countries with the majority of reported cases, only Bermuda did not report an increase in case rates from 1986 to 1987. Overall, the 20–44-year age group had the most cases; the number of reported cases peaked among 25–34-year-olds (Table 3).

Of 737 adult cases (≥ 15 years old) reported up to June 1988, 564 (76.5%) were among males and 173 (23.5%) among females; the male to female ratio was 3.3:1.

Table 2. Number of reported AIDS cases and case rate per 100,000 population in selected CAREC member countries[a] in 1987, and cumulative case rate per 100,000 as of 30 June 1988.

Country	Mid-year population in 1987	No. of cases reported in 1987	1987 case rate per 100,000	Cumulative case rate per 100,000
Bahamas	235,000	90	38.3	91.1
Barbados	256,000	24	9.4	24.6
Bermuda	59,400	21	35.3	126.3
Guyana	988,000	12	1.2	3.2
Jamaica	2,400,000	33	1.4	2.6
Trinidad and Tobago	1,230,000	86	7.0	25.2

[a]Countries reporting fewer than 10 new cases in 1987 are not included.

The proportion of AIDS reported in females has increased from year to year. While none of the 31 persons with AIDS reported up to 1984 were females, the proportion increased to 18.3%, 23.0%, 25.5%, and 28.9% in 1985, 1986, 1987, and 1988 (up to June), respectively.

Table 4 shows the distribution of reported adult cases by transmission categories: homosexual or bisexual males (45.0%), heterosexual males and females (44.1%), intravenous drug users (7.8%), blood transfusion recipients (1.9%), and hemophiliacs (0.3%). Overall, sexual HIV transmission was responsible for 89% of the total cases reported up to June 1988. Of 45 intravenous drug users with AIDS, 44 (98%) were from Bermuda.

Table 3. Age and sex distribution of cases reported as of 30 June 1988.

Age (years)	Male	Female	Total	%[a]
<1	22	12	34	5.3
1–4	15	13	28	4.4
5–14	2	2	4	0.6
15–19	9	2	11	1.7
20–24	53	28	81	12.6
25–34	187	77	264	41.2
35–44	98	24	122	19.1
45–54	47	15	62	9.7
>55	27	7	34	5.3
Unknown	143	20	163	—
Total	603	200	803[b]	100.0

[a]Percentages based on total cases for whom age information was available.
[b]For 24 cases, information on the sex was not available.

The first pediatric AIDS cases reported in the Caribbean were 11 cases in 1985, followed by 14 and 30 cases in 1986 and 1987, respectively. The male to female ratio of cumulative AIDS cases in children is 1.4:1. Of children under five years of age who have AIDS, all were born to HIV-positive mothers. The Bahamas reported the highest proportion of perinatally transmitted AIDS; 19% of reported cases were in children, compared to an overall Caribbean percentage of 10.3.

Comparison of risk behavior data over the last five years demonstrates a shift from the predominantly homosexual spread seen earlier in the epidemic toward the present pattern of predominantly heterosexual transmission (Figure 2). The number of homosexuals and bisexuals with AIDS continues to increase, but the relative increase of those who appear to have acquired AIDS heterosexually has been far greater.

As a result, the proportion of heterosexual persons with AIDS has steadily increased, while that among homosexuals and bisexuals has declined over the years. Of cases reported in 1986, 27% were heterosexual contact cases. This proportion increased to 56.2% in 1987 and to 61.1% of cases reported in 1988 up to June. In all countries reporting more than 60 cumulative cases, those cases as-

Table 4. Distribution of adult AIDS cases by major transmission categories, in CAREC member countries, 1982–June 1988.

Transmission categories	Male	Female	Unknown	Total	%[a]
Homosexual	170	—	—	170	29.5
Bisexual	89	—	—	89	15.5
Heterosexual	121	102	31	254	44.1
I.V. drug abuse	40	5	0	45	7.8
Transfusion	5	2	4	11	1.9
Hemophiliac	2	0	0	2	0.3
Other risk factors	0	0	0	0	0
No risk factor	4	1	0	5	0.9
Unknown	108	32	36	176	—
Total	539	142	71	752	100.0

[a]Percentages were calculated with a denominator of 576, excluding cases with unknown risk factors.

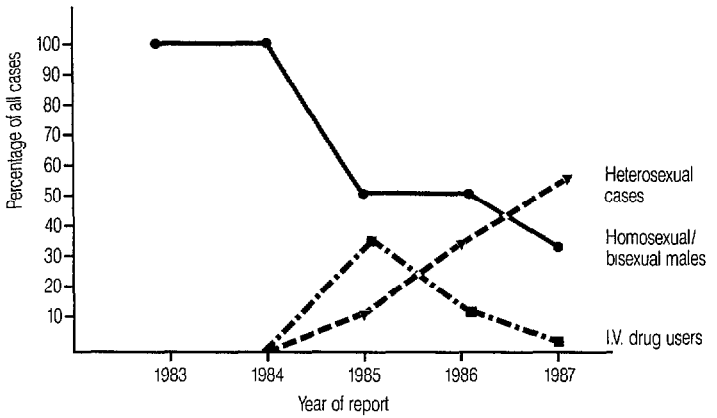

Figure 2. Proportion of reported cases by major risk categories in the Caribbean, 1983–1987.

sociated with heterosexual contact have been increasing.

In Trinidad and Tobago, among persons with AIDS resulting from sexual transmission, the proportion attributable to heterosexual contact increased from none in 1983 and 1984, to 13%, 25%, and 47% during the middle of 1985, 1986, and 1987, respectively. Data from Bermuda from 1985 to 1987 show an increase in heterosexual contact cases (from 6% to 24% of the total) and a decrease in reported cases among intravenous drug users.

HIV INFECTION

Some seroprevalence studies have been conducted in the Caribbean to assess the extent of HIV infection in specific population groups (Table 5).

One of the first serologic studies was conducted among homosexuals in Trinidad and Tobago (*3*); subsequent serosurveys and screenings have been conducted in persons from other identified high-risk groups, specifically prostitutes and persons seeking treatment at sexually transmitted disease clinics. In sexually active populations not at high risk, surveys have been conducted on women attending prenatal clinics and also on persons without known risk factors, such as blood donors. HIV seroprevalences range from 15–40% among homosexual and bisexual males, 4–10% among prisoners, 0–13% among prostitutes, 2% among cocaine users, and 0–2.5% among individuals attending STD clinics.

As of July 1988, 15 Caribbean countries were testing donated blood for HIV antibodies. The prevalence of HIV infection in nine countries reporting data has ranged from 0.04% to 1.55%, with a median of 0.26% (Table 6).

A 1982 outbreak of hepatitis B in Trinidad and Tobago provided an opportunity to obtain serum samples from a representative sample of 983 adults from the general population. Two of these persons (0.2%) had antibodies to HIV and both were from known risk groups. Among 4,000 food handlers tested in Jamaica during 1985–1986, none were found to have antibodies to HIV (*4*).

DISCUSSION

Our analysis of the cases reported to CAREC reveals that AIDS in the Caribbean occurs primarily among young to middle-aged adults, and although males

Table 5. Seroprevalence in several population groups, 1985–1988.

Population groups	Country	Year	No. tested	% positive
1. Homosexual/bisexual males	Trinidad and Tobago	1983	100	40.0
	Jamaica	1985–86	125	15.0
2. Prison inmates	Trinidad and Tobago	1987–88		
	—Males		59	10.2
	—Females		217	3.7
	Jamaica	1988	12	8.3
3. Prostitutes	Antigua	1986–88	470	1.7
	Guyana	1987	77	0
	Trinidad and Tobago	1988	223	13.0
4. Cocaine abusers	Trinidad and Tobago	1987	150	2.0
5. STD patients	Guyana	1986	26	0
	Jamaica	1985–86	2,400	0.1
	Trinidad and Tobago	1987–88	1,700	2.5
6. Migrant farm workers	Dominica	1985–87	202	0
	Grenada	1985–87	133	0
	Jamaica	1985–86	7,470	0.6
	Saint Lucia	1985–86	1,086	1.6
	St. Vincent and the Grenadines	1985–87	1,038	1.1
7. Healthy adults, as part of viral hepatitis survey	Trinidad and Tobago	1983	983	0.2
8. Prenatal clinic attendees	Trinidad and Tobago	1988	203	0
9. Food handlers	Jamaica	1985–86	4,000	0
10. Hospital patients other than those with STD or cancer	Trinidad and Tobago	1985–86	370	0.5

are still more likely than females to have AIDS, the gap is narrowing. The proportion of new cases attributable to heterosexual transmission is increasing. Given the prevailing pattern of sexual behavior, the rapid spread of HIV from bisexuals (and possibly from intravenous drug abusers in some countries) to heterosexual persons, and the size of the heterosexual population, it is inevitable that sexual transmission will continue to occur and to increase in the Caribbean. This will, in turn, directly and significantly affect perinatal transmission of HIV, which is already a substantial problem in many countries of the area.

The World Health Organization's Global Program on AIDS has described three distinct epidemiologic patterns of AIDS in the world. In general, the epidemiology in the Caribbean does not fit easily into any pattern. In the larger Caribbean countries, the epidemic began among homosexuals (Pattern I) and then shifted rapidly towards Pattern II, in which heterosexual transmission is the predominant mode of spread. The male

Table 6. HIV seroprevalence (%) among blood donors.[a]

Country	1986	1987
Bahamas	—	0.50
Barbados	—	0.11
Bermuda	0.04	0.09
Cayman Islands[b]	—	0.49
Grenada[b]	—	0.26
Jamaica	0.27	0.23
St. Vincent and the Grenadines[b]	—	0.45
Suriname	—	0.04
Trinidad and Tobago	1.5	1.55

[a]Based on quarterly reporting system.
[b]Based on fewer than 500 donors tested.

to female case ratio in Trinidad and Tobago up to 1985 was 5.9:1, but has declined steadily since then.

The Caribbean countries have a serious AIDS problem with one of the highest annual incidence rates in the world. Since the virus was introduced in the late 1970s, primarily among the homosexual population by gay and bisexual men traveling between the Caribbean and North America, and considering that AIDS often has a 7–8 year or longer incubation period, the yearly increase in heterosexual contact cases has been extremely rapid. In part, this could be explained by factors related to the sexual behavior of the population, such as a higher ratio of bisexual to homosexual males than in North America, the nature of sexual/marital relationships, and perhaps the increasing level of STDs. It is generally believed that most Caribbean homosexuals, unlike those in the United States, tend to be bisexual because homosexuality is not well tolerated in the area. Strong social and religious disapproval makes it difficult to follow a homosexual lifestyle openly—many homosexuals are married, have children, and perhaps continue to engage in both homosexual and heterosexual activity. HIV probably was introduced into the heterosexual population when bisexual males had sexual contact with women. This hypothesis is supported further by data from Trinidad and Tobago which show that, while initial cases resulting from heterosexual contact were women with bisexual partners, 72% of the heterosexual cases reported in 1987 were among males whose only risk activity was frequent sexual contact with females (*5*), indicating female-to-male transmission of HIV.

Further spread of HIV in the community may have been facilitated by the fact that men and women tend to have multiple sexual partners (*6*). In many communities, it seems, sex is not often linked to monogamous relationships: serial consensual unions are common, and uninterrupted and civilly sanctioned monogamous marriages are in the minority (S. Mintz, as quoted in *5*). The fluidity of sexual relationships and the custom for men to have multiple partners have been documented in several anthropological studies (*7, 8*). In addition, risk factors such as teenagers engaging in unprotected sex (*9*) and the increasing levels of sexually transmitted diseases, particularly syphilis, have further contributed to rapid spread of HIV in the Caribbean.

This increase in heterosexual transmission in the Caribbean has inevitably resulted in more HIV infection. Pediatric AIDS is already a substantial problem in many countries, where the proportion of children among reported AIDS cases is 10%. This figure is far greater than that from North America and Europe, where the proportion is less than 3% (*10, 11*). Some Caribbean countries are still at the initial stages of the epidemic (Guyana, for example, where the first cases were reported as recently as 1987), but given the general trend seen in most other Caribbean countries, this is expected to change.

Faced with the increasing problem of AIDS and HIV infection, the governments of all Caribbean countries have taken the problem very seriously: national AIDS committees have been established, education of health care workers and the general public has been started, and almost all countries now screen donated blood. The majority of countries have started implementing short-term programs (one year) for AIDS prevention and control, and most have developed medium-term plans (three years) with assistance from the Pan American Health Organization, the World Health Organization's Global Program on AIDS, and CAREC.

Priorities and strategies for the

medium-term programs for AIDS control in the Caribbean are based on available epidemiologic evidence. These priorities include strengthening of epidemiologic surveillance through HIV serosurveys and serosurveillance studies, and prevention of sexual transmission and of perinatal transmission through information and education strategies aimed both at those engaged in high-risk behaviors and at the general population. To this end, it is important to conduct knowledge, attitude, and practice surveys, especially of specific target groups, and to follow these studies with interventions. Such surveys have been carried out in some countries, including Grenada and Jamaica. It is also important to take steps to reduce the social and economic impact of HIV on individuals, groups, and societies. In the absence of a vaccine or an effective therapy, the development and strengthening of AIDS education and information campaigns and of counselling services in all countries of the Caribbean remain the most important strategies for containing the spread of the virus.

REFERENCES

1. World Health Organization, Global Program on AIDS. Update on AIDS, July 1988.
2. St. John, R., M. Clifford, and F. Zacarías. Epidemiology of AIDS in the Americas. Paper presented at the IV International Conference on AIDS, Stockholm, 12–16 June 1988.
3. Bartholomew, C., C. Saxinger, J. W. Clard, M. Gail, A. Dudgeen, B. Mahabir, B. Hull-Drysdale, F. Cleghorn, R. C. Gallo, and W. A. Blattner. Transmission of HTLV-1 and HIV among homosexual men in Trinidad. *JAMA* 257(19):2604–2608, 1987.
4. Murphy, E., P. Figueroa, W. N. Gibb, *et al.* Retroviral epidemiology in Jamaica, West Indies: Introduction of HIV into an HTLV-1 endemic island. Paper presented at the III International Conference on AIDS, Washington, D.C., 1–5 June 1987.
5. Cleghorn, F., *et al.* In: *Proceedings of the London Conference on Global Impact of AIDS,* March 1988, p. 55.
6. Bishop, J. Family life in the Caribbean—Sociocultural issues which affect AIDS prevention strategies. Presented at the CAREC Workshop on Prevention Counselling, July 1988.
7. Kerr, M. *Personality and Conflict in Jamaica.* Collins, London, 1963.
8. Hodge, M. Young women and the development of stable family life in the Caribbean. *A Journal of the Caribbean Artists Movement,* 1977.
9. Jagdeo, T. P. Myths, misconceptions and mistakes: A study of Trinidad adolescents. The Family Planning Association of Trinidad & Tobago, 1986.
10. Centers for Disease Control. Reports on selected racial/ethnic groups. *MMWR* 37:1–3, 1988.
11. Health Education Authority and Public Health Laboratory Service AIDS Centre, United Kingdom. A quarterly epidemiological briefing on AIDS/HIV in the United Kingdom. Issue 1, March 1988.