

# Prevalence of Infection with Human Immunodeficiency Virus in Cuba

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*This article describes the National AIDS Prevention and Control Program in Cuba and presents the results of serologic studies of HIV prevalence. As of 30 May 1988 2,224,748 individuals (approximately one-third of the Cuban population plus 32,750 foreigners) of sexually active age from high-risk and other population groups had been screened to detect HIV antibody. Among resident Cubans a total of 227 HIV infections were found, indicating a prevalence of 0.01 seropositives per 100 people tested. The seroprevalence of HIV among blood donors is on the order of one infection per 50,000 people, and appears to have declined since 1986. The seroprevalence of HIV among groups at risk is relatively low compared to that found among similar groups in other countries.*

Actions for the prevention and control of acquired immunodeficiency syndrome (AIDS) in Cuba go back to the beginning of 1983, when a National Multidisciplinary Commission was created and given the fundamental objective of advising the Ministry of Public Health on the measures that needed to be adopted to prevent the disease. This occurred long before the first case was reported in Cuba in mid-1986.

Subsequently, the first measures taken were to suspend imports of blood products from countries that had reported AIDS cases and to implement a system for special epidemiologic surveillance of patients with Kaposi's sarcoma and opportunistic infections.

At the end of 1985, when tests were available to detect antibodies to the human immunodeficiency virus (HIV) that causes AIDS, a much more complete and efficient control program was designed. The general purpose of this program, ini-

tiated in January 1986, was to use scientific grounds to guide the efforts aimed at preventing the spread of AIDS, a spread that was occurring in numerous countries on several continents.

The principal immediate objectives of the Cuban program have been as follows:

- to design and employ a system for epidemiologic surveillance of HIV infection and disease;
- to determine groups at risk;
- to establish quality control of all blood and blood products utilized in the country;
- to make early diagnoses and to treat patients and carriers of the virus;
- to carry out an epidemiologic study and trace the contacts of all seropositive individuals identified;
- to minimize the possibility of perinatal transmission by conducting serologic tests on all pregnant women during the first trimester of pregnancy and terminating the pregnancies of seropositive women; and

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**Table 1.** HIV seropositivity among the various Cuban population groups tested, January 1986–May 1988.

Population group	1986	1987	1988 (January– May)	Total	HIV prevalence (No. seropositive per 100 tested)
<i>Specific groups at risk:</i>					
Blood donors	304,856	491,884	238,942	1,035,682	0.0018
Pregnant women		79,063	83,949	163,012	0.002
Hospital inpatients		99,348	199,937	299,285	0.003
Patients with other sexually transmitted diseases (syphilis or gonorrhoea)		9,552	33,753	43,305	0.016
Contacts of HIV seropositive people	766	350	242	1,358	4.5
Other groups at risk	280,487	144,856	48,547	473,890	0.03
<i>General population of:</i>					
Cabaiguán		37,744		37,744	0.019
Varadero		11,359	11,502	22,861	0.004
Old Havana			103,583	103,583	0.0019
Guantánamo			6,277	6,277	0.00
Isle of Youth			5,001	5,001	0.00
Subtotal (Cubans)	586,109	874,156	731,733	2,191,998	0.01
Foreigners	17,652	6,452	8,646	32,750	0.4
<b>Total</b>	<b>603,761</b>	<b>880,608</b>	<b>740,379</b>	<b>2,224,748</b>	

Source: Cuba, Ministerio de Salud Pública, Dirección Nacional de Epidemiología.

- to carry out publicity and educational activities directed at reducing the risk of sexual transmission of HIV.

In addition, insofar as it was possible to develop an appropriate diagnostic technology that would reduce the high cost of importing equipment and reagents, a strategy was developed for screening large groups in the general population. So far, this strategy has been implemented without great difficulty.

## THE CURRENT SITUATION

As of 30 May 1988 a total of 2,224,748 serologic tests to detect HIV antibodies had been performed. This total represents approximately a third of the country's sexually active population and somewhat more than a fifth of the entire population. Overall, 227 of the resident

Cubans tested (0.01 per 100 tested) were identified as seropositive (Table 1).

The total tested population of 2,224,748 included blood donors, members of groups at risk (international travelers, homosexuals, people with sexually transmitted diseases, AIDS case contacts, etc.), adult patients admitted to clinical/surgical and gynecological/obstetric hospitals, women in the first trimester of pregnancy, and other groups from the general Cuban population. Also included were some 32,000 foreign students who came to reside in our country for extended periods, among whom an additional 131 seropositives were detected.

Table 1 shows the prevalence of seropositivity in each of the principal groups investigated. The highest seropositivity (4.5 seropositives per 100 tested) was found among the contacts of seropositive individuals. Within the group of international travelers, merchant seamen (not

**Table 2.** Distribution of individuals seropositive for HIV according to the classification for HIV infection of the U.S. Centers for Disease Control (CDC).

Group	Seropositive individuals	
	No.	(%)
I (acute infection)	—	(0.0)
II (asymptomatic infection)	148	(65.2)
III (persistent generalized lymphadenopathy)	46	(20.3)
IV (other illness)	33	(14.5)
Total	227	(100)

Source: Cuba, Ministerio de Salud Pública, Dirección Nacional de Epidemiología.

shown in the table) exhibited the highest seroprevalence (0.6 seropositives per 100 tested). People with other sexually transmitted diseases (syphilis or gonorrhea) showed a prevalence of 0.016 seropositives per 100 tested, nearly 10 times higher than that observed among blood donors but relatively low compared to seroprevalences found by similar studies published in the international literature.

Tables 2 and 3 show the clinical classification of the 227 seropositive individuals up through the last evaluation performed at the end of May 1988. The 33 cases in Group IV (see Table 3) were distributed among all five recognized subgroups and categories, though cases of secondary (opportunistic) infections predominated.

These 33 cases included those of eight patients who had already died.

More than 97% of the seropositives identified acquired the infection sexually, with heterosexual transmission predominating in absolute terms. However, male homosexuals and bisexuals experienced a higher relative risk. Heterosexual transmission in both directions (man to woman and woman to man) has been confirmed, as have both directions of male homosexual transmission (active to passive and passive to active). The male to female ratio was 3:1 among the infected subjects and very similar among those who were ill.

Epidemiologic investigation and contact tracing have made it possible to conclude that sexual relations with foreigners, both within and outside the country, were the source of contagion for almost three-fourths of the total infected population. Secondary cases resulting from sexual contact with these latter people were less important as a source of detected seropositivity.

Only five of the seropositives (2.2%) acquired the infection through a nonsexual mechanism of HIV transmission, one perinatally and four via blood transfusions received before blood quality control had been established in the country (Table 4).

It is noteworthy that only one of the

**Table 3.** Distribution of the 33 HIV seropositive individuals in CDC Group IV (other diseases).

Group IV subgroup	Subgroup category	Cases	
		No.	(%)
A (systemic disease)	—	3	(9.1)
B (neurologic disease)	—	3	(9.1)
C (secondary infections)	1 <sup>a</sup>	15	(45.5)
C (secondary infections)	2 <sup>b</sup>	10	(30.3)
D (secondary cancers)	—	1	(3.0)
E (other disorders)	—	1	(3.0)
Total		33	(100)

Source: Cuba, Ministerio de Salud Pública, Dirección Nacional de Epidemiología.

<sup>a</sup>Secondary infections specified in the CDC surveillance definition for AIDS.

<sup>b</sup>Other specified secondary infections.

**Table 4.** Modes of HIV transmission to the 227 seropositive Cubans whose cases were detected from January 1986 through May 1988.

Mode of transmission	Seropositive individuals	
	No.	(%)
Sexual relations with foreigners	161	(70.9)
Sexual relations with known seropositives	61	(26.8)
Blood transfusions (before 1986)	4	(1.8)
Perinatal transmission	1	(0.4)
Total	227	(100)

Source: Cuba, Ministerio de Salud Pública, Dirección Nacional de Epidemiología.

four seropositives infected by transfusion was a hemophiliac. This illustrates the low index of HIV circulation in Cuba as compared to other countries (in the United States, for example, the prevalence of HIV infection among hemophiliacs is around 70%, and in many countries of Western Europe it exceeds 50%).

Table 5 shows the chronologic evolution of the prevalence of seropositivity among blood donors in our country. These data indicate a progressive decline in the overall number of seropositive blood donors, even though the requirements for donating blood have not been modified and the number of donations has increased. This circumstance, together with the fact that almost all the seropositive individuals detected were from one of the principal high-risk groups, suggests that this virus has not

extended into the population of young sexually active males who constitute our main source of blood donors.

The tests performed on pregnant women have revealed a seroprevalence similar to that found in other young people. Specifically, four seropositives were detected among 163,012 pregnant women tested, yielding a seroprevalence (0.002 per 100) similar to that found in blood donors (see Table 1). Three of the four seropositive women were contacts of seropositive individuals, and the remaining one was a young woman who had frequent sexual relations with foreigners.

A prospective analysis of the prevalence of seropositivity among pregnant women reveals a declining trend similar to that observed among blood donors. In 1987 (when this investigation began) three seropositive pregnant women were detected from among the 79,063 tested, yielding a seroprevalence of 0.0038 per 100 tested, while in 1988 only one seropositive pregnant woman was found among the 83,949 tested, yielding a prevalence of 0.0012 per 100 tested.

## SCREENING OF THE GENERAL POPULATION

Once a test to detect HIV antibodies became available, studies were begun on the sexually active groups in the general population with a view to making a rela-

**Table 5.** Changes of HIV seroprevalence among blood donors in Cuba, based on data for 1986, 1987, and early 1988.

Year	No. tested	No. seropositive	HIV prevalence (No. seropositive per 100 tested)
1986	304,856	14	0.0046
1987	491,884	5	0.0012
1988 (Jan.-May)	238,942	—	0.0000
Total	1,035,682	19	0.0018

Source: Cuba, Ministerio de Salud Pública, Dirección Nacional de Epidemiología.

tively quick determination of the magnitude of HIV spread.

To date, five population groups have been investigated in this manner. The testing has been carried out on volunteers from the selected populations, and in all cases has been preceded by an information campaign explaining the objectives and nature of the screening. The level of acceptance by the inhabitants has been high, and the information activities and taking of samples have been carried out by the regular primary health care services, reinforced by the educational facilities of the schools of medicine and nursing and supported by local citizens' organizations. Processing of the samples has been accomplished quickly and has not interfered with the program's other activities.

In all cases, the screening has tested over 90% of the estimated population, and a subsequent evaluation of the quality of the work carried out has been conducted. The following accounts provide more detailed descriptions of the studies performed.

### *Cabaiguán*

This municipality, in the province of Sancti Spíritus, has a population of about 40,000 inhabitants over 15 years of age. In 1987 large-scale screening was carried out here because of Cabaiguán's relatively high prevalence of seropositive inhabitants (with respect to other municipalities in the country) belonging to various high-risk groups.

A total of 37,744 inhabitants were tested, of whom seven were found to be seropositive (0.019 seropositives per 100). It was confirmed that all seven (mainly male homosexuals/bisexuals) were associated with a focus of infection located in this municipality.

### *Varadero*

This locality was selected for screening because every year it receives tens of thousands of foreign tourists, most of them from countries where HIV infection has reached significant endemic levels.

The first study carried out in this community of approximately 12,000 adult inhabitants, concluded at the beginning of 1987, only detected one seropositive individual among the 11,359 people tested, indicating a prevalence of 0.009 per 100. Subsequent epidemiologic investigation showed that the infected person was a male homosexual who had frequent sexual relations with foreigners.

In March of 1988 (one year later), the screening was repeated; on this occasion 11,502 people were tested and all were shown to be serologically negative.

### *Old Havana*

In February 1988 a testing program began screening a population of about 111,000 residents over age 15 in the capital city area of Old Havana. This region, located around the Port of Havana, was known to have a high incidence of sexually transmitted diseases (mainly syphilis and gonorrhea). Since HIV is commonly transmitted the same way as these diseases and since people exposed to these diseases may also be exposed to HIV, it was logical to suppose that screening this population would lead to detection of the virus in the capital.

In a little over two months 103,583 persons were tested. However, only two of them showed antibodies to HIV. This prevalence (0.002 seropositives per 100 tested) was almost the same as the seroprevalences found among blood donors and pregnant women. Once again, epidemiologic investigation of the seropositive subjects made it clear that the

sources of infection were seropositive individuals who had had contact with foreigners.

### *Guantánamo*

The epidemiologic importance of this municipality derives from its having the highest prevalence of leprosy patients in the country. For this reason, mass screening was being conducted in Guantánamo to detect anti-leprosy antibodies by means of an innovative ELISA technique developed in our setting that makes it possible to identify leprosy patients early.

It was decided to expand this program in order to assess the seroprevalence of HIV. To date, more than 6,000 Guantánamo residents have been tested serologically for HIV, and all the results have been negative.

### *Other Studies*

Our program has envisioned systematic screening of the special population groups considered to be at risk for HIV infection. Despite this assumption of risk, the fact is that the prevalences found among these groups, although higher than those found in the general population, appear very low compared to prevalences reported for similar groups in other countries.

For example, the seroprevalence of HIV infection (0.016 per 100) found among sexually transmitted disease patients is very low, considering that prevalences reported for such patients in the United States, Western Europe, and certain African countries have exceeded 10%.

Similarly, the seroprevalence found among hospitalized patients (0.003 per

100) is between a hundred and a thousand times lower than that found in some sentinel hospitals in the United States. The same is true of Cuban prisoners, who show a prevalence of 0.01 seropositives per hundred tested.

## CONCLUSIONS

The results of these serologic and epidemiologic investigations of HIV's prevalence and spread in one-third of the Cuban population of sexually active age, together with contact tracing and implementation of the other prevention and control measures envisioned in our program, make it possible for us to suggest that the extent of the spread of the causative agent of AIDS in our setting is very limited and that, far from showing the increases evident in many countries, HIV circulation is tending to decline.

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