Cuba's National AIDS Program
The First Decade

REUBEN GRANICH, MD; BRADLY JACOBS, MD, MPH; JONATHAN MERMIN, MD; *and*
ALLAN PONT, MD, *San Francisco, California*

There is a high incidence of infection with the human immunodeficiency virus (HIV) in many Caribbean nations. But by 1993 Cuba, with a population of greater than 10 million people, had fewer than 1,000 seropositive persons and less than 200 cases of the acquired immunodeficiency syndrome (AIDS). To investigate Cuba's approach to the AIDS epidemic, we visited Cuba, reviewed published statistics, spoke with health care officials, interviewed HIV-positive patients, and toured medical facilities. Cuba established an extensive HIV surveillance program in 1983, and more than 15 million HIV antibody tests have been done. The sexual contacts of all infected persons are closely observed. A national education program is evolving. Since 1986, all known HIV-positive patients have been placed in sanitariums, which is the most controversial aspect of Cuba's program. We review available information on AIDS in Cuba and describe that nation's attempt to prevent the spread of disease. We discuss how the political system and Cuba's relative isolation have influenced this approach. Strategies have been developed that may be of limited efficacy and would not be acceptable in most Western nations.

(Granich R, Jacobs B, Mermin J, Pont A: Cuba's national AIDS program—The first decade. West J Med 1995; 163: 139-144)

The World Health Organization (WHO) estimates that worldwide between 9 and 12 million people are infected with the human immunodeficiency virus (HIV).[1(pp886-887)] As of January 1, 1992, more than 300,000 people were infected with HIV in the Caribbean countries.[1] About 8,000 cases of the acquired immunodeficiency syndrome (AIDS) from that region have been reported to the WHO (Table 1).[2] Although HIV infection has been a major problem for many countries in the Caribbean, as of May 1993, Cuba with a population of more than 10 million, has had only 187 cases of AIDS.

To investigate Cuba's approach to preventing the spread of HIV, we obtained a research grant from the Center for Latin American Studies at Stanford (California) University. In May 1993, two of us (R.G. and B.J.), both fluent in Spanish and English, spent three weeks in Cuba. To gather data that were as objective as possible, we elected not to travel as official guests of the government. Cuban health care professionals who were directly involved in AIDS care were open to meeting with us.* We talked with policy makers, visited health care facilities, interviewed 15 persons with HIV infection, and polled many residents of Havana. We describe our impression of Cuba's current strategy to confront the AIDS epidemic. We were not involved in primary data collection. The accuracy of the data presented is difficult to assess, but because little information regarding HIV infection in Cuba has been published, this article provides an opportunity to critically examine the available information.

Cuban Health Care System

Cuba's approach to the HIV epidemic is an integral component of its national health care system. It has been well documented that Cuba's national health statistics resemble those of an industrialized country.[3-6] The infant birth and mortality rates are low. Infectious diseases that are related to poor sanitary conditions are uncommon. The incidence of cancer and of cardiovascular disease is similar to that of the United States, and there is an aggressive tuberculosis control program.[7] The prevalence of injection drug use is extremely low. A recent epidemic of optic and peripheral neuropathy affecting thousands

*Interviews in Spanish and English were held with the following persons: Jorge Perez, MD, Director, Santiago de las Vegas sanatorium, and Professor of Pharmacology and Medicine, Havana University Medical School; Giselda Sanabria, MD, Director of the National Center Health Education; Lourdes Flores, MD, Director of the National Center for Sex Education; Juan Carlos de la Concepcion, MD, Director, Grupo Prevención SIDA, and resident of Santiago de las Vegas sanatorium, Havana; Raul Llanos, PhD, economist and resident of Santiago de las Vegas sanatorium; Jeremias Ojito, MD, Director, National Center for Medical Science Information of the Ministry of Public Health; Cosme Ordones, MD, Director of Policlinic, Plaza de la Revolución, Havana, and Founder of the National Family Medicine Doctor Program; Sergio Sokol, MD, Family Medicine Clinic physician, Consultorio #21, Plaza de la Revolución; and Karen Wald, Journalist. We also visited the Santiago de las Vegas sanatorium in Havana, the Pedro Kouri Tropical Medicine Institute AIDS ward and reference laboratories, the Plaza de la Revolución Policlinic, a Family Doctor Clinic, the National Center for Medical Science Information, the National Center for Health Education, the National Center for Sex Education, and the National Center for the Perfection of Medical Personnel.

From the California Pacific Medical Center (Drs Granich and Pont) and the San Francisco General Hospital Medical Center (Dr Mermin), University of California, San Francisco, School of Medicine (Dr Jacobs), San Francisco.

This work was supported in part by the Center for Latin American Studies, Stanford University, Stanford, California.

Reprint requests to Reuben Granich, MD, Dept of Medicine, California Pacific Medical Center, 2351 Clay St, #414, San Francisco, CA 94115.

ABBREVIATIONS USED IN TEXT

AIDS [SIDA]= acquired immunodeficiency syndrome
ELISA = enzyme-linked immunosorbent assay
HIV = human immunodeficiency virus
WHO = World Health Organization

of persons has been reported, and some foreign and Cuban investigators have concluded that the outbreak may be the consequence of nutritional deficiencies related to worsening economic conditions.[8,9]

Health care delivery is based on a network of 420 *policlinics* (large multispecialty clinics) with large referral hospitals in each province. This system is modeled after similar approaches in eastern European countries. In 1983 the Family Doctor Program was initiated to deliver community-based primary care. Family physicians maintain *consultorios* (offices), and each is responsible for the health of 600 to 1,000 residents. They regularly review their case load with specialists and other health care professionals. House calls are a key component of the program, and family physicians have personal relationships with many of their patients. They routinely identify persons at risk for HIV infection and provide AIDS education and screening.

Cuba's Current HIV Screening Strategy

The Cuban government established a national AIDS program in 1983. The importation of blood products was prohibited, and a domestic acquisition program was instituted. Annually there are more than 600,000 blood donations, each of which is tested for HIV. In 1984 a surveillance system was implemented in hospitals and clinics to detect possible defining diseases of HIV such as Kaposi's sarcoma and *Pneumocystis carinii* pneumonia.

In 1986 HIV screening was initiated for all people who had traveled since 1976 to countries that had reported cases of HIV infection. Since 1987 screening has been done systematically for defined groups, including patients admitted to a hospital, patients with sexually transmitted diseases and their partners, Cubans traveling outside the country, pregnant women in the first trimester and at delivery, prison inmates, workers in the tourist industry, merchant sailors, and public health employees. As of May 1988, 32,750 temporary residents had been tested on arrival and six months later. Testing for HIV has been integrated into routine health care, and many Cubans now perceive the HIV test as part of a normal health screening. About 2 million tests are performed annually.

In 1986 Cuba began the development of a domestic enzyme-linked immunosorbent assay (ELISA) and a Western blot test for HIV. A national network of 52 laboratories now does initial serologic screening with domestically manufactured tests. Specimens that are ELISA-reactive are retested and, if positive on a second test, are referred to the National Reference Laboratory. The reference laboratory repeats the test using competitive and indirect ELISA systems and also runs a Western blot test. Patients with a positive result are required to provide a second serum specimen. If the patient continues to test positive, the National Division of Epidemiology is notified. Indeterminate results are followed up with a radioimmunoprecipitation test and viral culture. World Health Organization criteria are used to interpret test results.[10,11] According to Ministry of Public Health officials, Cuba's tests have been validated with an international standard in collaboration with the Oswaldo Cruz Foundation in Brazil and Sweden's Ministry of Public Health.[12,13]

TABLE 1.—*Comparative AIDS Statistics in Caribbean Basin as of January 1, 1992*

County/Territory	AIDS Cases, No.*	Population, millions†	AIDS Cases/ 100,000
Barbados	250	0.3	83
Dominican Republic	1,574	7.5	21
Haiti	3,000	6.4	47
Puerto Rico	8,000	3.5	229
Cuba	95	10.5	1

AIDS = acquired immunodeficiency syndrome

*From the World Health Organization.[2]

†From the 1992 World Population Data Sheet, Population Reference Bureau, Inc, Washington, DC, Information.

Results of the Screening Program

Between April 1986 and May 1993, about 15 million ELISA tests were performed with Western blot test confirmation of 927 people with HIV (some persons were screened more than once); 71% were male. Of the male cases, 62% were homosexual or bisexual. Of the 927 cases, 54% were attributed to heterosexual transmission. No case of HIV transmission could be ascribed to injection drug use. With about 180,000 births annually, there have been only 4 pediatric cases of HIV infection. Less than 2% of HIV cases were considered related to occupational exposure or perinatal or blood product transmission. During this seven-year period, there were 3,728,689 blood donations, of which 51 (0.001%) were HIV-positive. Most of the cases of HIV-1 infection occurred in the urban province that includes the capital, Havana. In all, 79% of patients report acquiring HIV in Cuba, and 18% were infected in Africa. The remaining cases resulted from acquisition in the Americas or Europe. Screening of inpatients, pregnant women, sexual contacts of people seropositive for HIV, and patients with sexually transmitted disease has demonstrated HIV seroprevalence rates of 0.003%, 0.000016%, 6.8%, and 0.013%, respectively.

Figures 1 and 2 show the annual incidence of HIV and AIDS from 1986 through 1992, but the incidence of HIV remains low. The number of AIDS cases, although small, is rising. This increase probably reflects disease progression in people infected in the early 1980s. Of persons who test positive for HIV, 63% were detected in an early phase II or III of the 1987 revised Centers for Disease Control and WHO AIDS classification.[11,13] The mean survival with AIDS is 18 months. The principal opportunistic infections among the first 125 AIDS patients are similar to those found in industrialized countries, with the exception that there is a paucity of cases of tuberculosis (Table 2).

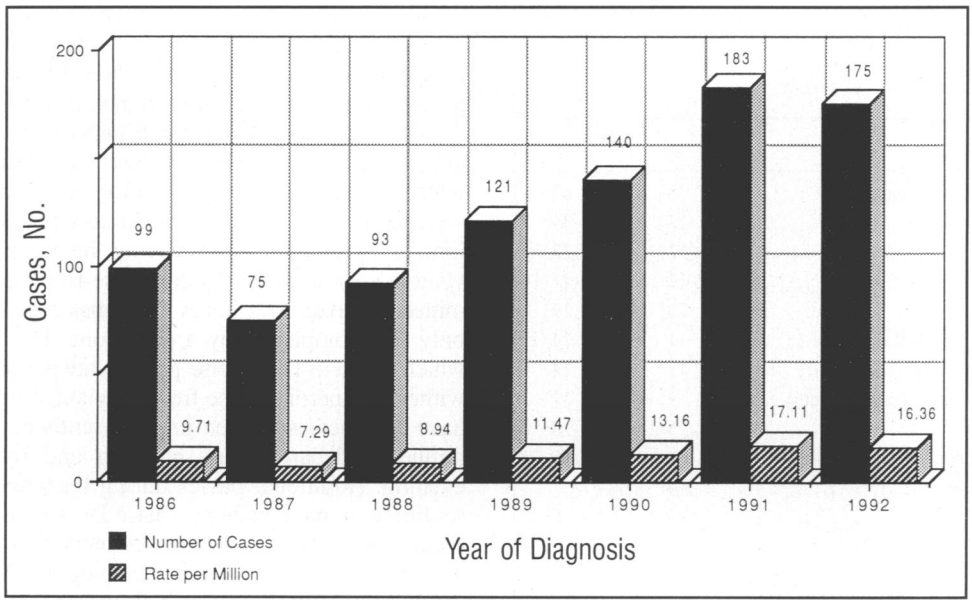

Figure 1.—Both the number of new cases of infection with the human immunodeficiency virus (HIV) and the rate per million rose relatively steadily between 1987 and 1992. The increased number of cases noted in 1986 is due to the introduction of HIV testing to Cuba during that year. People who were infected before and during 1986 were included; subsequent years better reflect the incidence of new infections.

Approach to Patients Positive for the Human Immunodeficiency Virus

People with confirmed positive tests are contacted and counseled by an epidemiologist or family physician. The patient is then referred to the National Institute of Tropical Medicine for evaluation and placement in a sanitarium. Pregnant women who are HIV-positive are counseled and given the option to have a therapeutic abortion. Abortions are strongly recommended, and about 98% of HIV-seropositive mothers have elected to terminate their pregnancies. Future plans call for a team of health care workers headed by a person with HIV to contact and counsel people who are newly diagnosed with HIV.

In 1986 the tracing of contacts and the screening of sexual partners of HIV-positive persons was begun. Sexual contacts are tested for HIV every three months for a period of one year after the last sexual contact with the

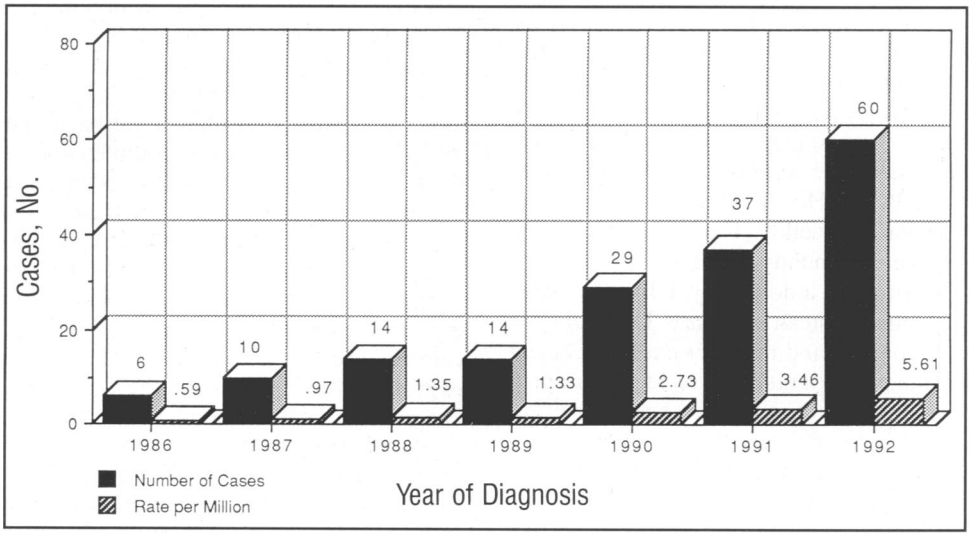

Figure 2.—Both the number of new cases of the acquired immunodeficiency syndrome (AIDS) and the rate per million rose relatively steadily between 1986 and 1992. Any effects of a human immunodeficiency virus control program would not be reflected by a changing incidence of AIDS for several years due to the long incubation period of the virus.

TABLE 2.—*Opportunistic Infections and Malignant Neoplasms in 125 Cuban Patients With the Acquired Immunodeficiency Syndrome (AIDS)**

Diagnosis	AIDS Patients %	No.
Pneumocystis carinii pneumonia	50	63
Oral candidiasis	27	34
Hairy leukoplakia	17	22
Cryptosporidiosis	17	21
Toxoplasmosis†	15	19
Disseminated cytomegalovirus	11	14
HIV wasting syndrome	10	12
Herpes simplex virus (mucocutaneous)	9	11
Lymphoma	6	8
Cryptococcus species infection	4	5
Kaposi's sarcoma	4	5
Histoplasmosis	4	5

HIV= human immunodeficiency syndrome

*From written communication, Jorge Perez, MD, Director, Santiago de las Vegas sanitorium, May 1993.
†Central nervous system.

proband. Sexual partners are observed for as long as they remain in contact with the index case. By 1989 approximately 80% of the 1,317 sexual contacts of HIV-seropositive persons had been tested. Of these, 5.1% of the partners of male homosexuals, 10.4% of the partners of male heterosexuals, and 3.4% of the women partners of male bisexuals were infected.

Sanitarium Treatment Program

The most controversial aspect of the national AIDS program is the use of sanitariums for people with HIV. Cuba's sanitarium policy was established in 1986 and has evolved over time. The Santiago de las Vegas sanatorium was constructed by the military to house patients with HIV in an attempt to reduce transmission of the disease. The first residents were predominantly returning "internationalists" who had served in Africa. In 1987 a growing number of civilians were found to be HIV-seropositive, and the military handed over responsibility for the center to the Ministry of Public Health, who transformed the barracks into a sanitarium facility. The sanitarium is now an enclosed suburban community of several acres that includes houses, apartments, a dormitory, a library, recreational facilities, a clinic, and an infirmary. The quality of the housing has improved and meets or exceeds current Cuban housing standards. Sanitarium residents are provided with free housing, food, and medical care. They are given their former salaries and have the option to work.

Persons with newly diagnosed HIV infection are placed in 1 of the 14 provincial sanitariums nearest their homes. Residents undergo evaluation to assess the risk that they might transmit HIV while in the community. Most residents receive a satisfactory evaluation and are permitted to leave the sanitarium for short periods of time without a chaperone. Residents with "unsatisfactory" evaluations are allowed to leave only with a chaperone. These persons are considered to be at risk for transmitting HIV or unable to care for themselves. Evaluations are frequent, and changes in status are not uncommon.

The sanitarium policy regarding contact between residents and the community has evolved. During phase I, which began in 1986 and lasted for three months, patients were removed from their communities, placed in a sanitarium, and prohibited from leaving the premises, although visitors were allowed. Under phase II, patients were permitted to leave for 18 hours four times every three months only if accompanied by a chaperone. During phase III, which began in 1989, some patients are permitted to go out without chaperones. The frequency and duration of leave have also increased over time. Currently patients are permitted to depart Friday morning and return Monday evening. Additional passes during the week are granted routinely to many patients. Phase IV is scheduled for implementation, and this new policy includes a transition to a sanitarium-based ambulatory care program. Most residents would be permitted to voluntarily return to their communities after an initial evaluation and treatment period.

Cuban officials feel pressure from many sources about their sanitarium policy. These include residents and their families, Cuban dissidents, international publicity, and new epidemiologic information regarding the modes of HIV transmission.[14]

Sanitarium residents are observed by a team of physicians, psychologists, social workers, and nurses. The level of knowledge of the health care professionals, the availability of medications, and the nutritional support provided to residents exceed the Cuban national standard. There is 1 physician for every 50 patients, and health care workers frequently visit the dwellings of residents. An infirmary is accessible on a 24-hour basis. Immunologic status is evaluated using CD4+ counts and standard clinical measures such as signs of opportunistic infections. Common antibiotics, antifungals such as fluconazole and amphotericin B, antiretrovirals such as zidovudine and didanosine, and antivirals such as ganciclovir and acyclovir are usually available. Herbal remedies are also used. Patients with serious complications are referred to the National Tropical Medicine Institute. Cuba's worsening economic situation and the trade embargo by many western nations is reducing the availability of medicines, equipment, medical literature, and some basic supplies.

Interviews with sanitarium residents revealed a variety of opinions. They appreciated the high standard of care and the living conditions. They almost universally expressed frustration with the restriction of freedom. Given the choice, some residents would not accept the sanitarium system. They questioned the possible benefits to them or the community. For others, however, sacrifice for the community is an integral part of the postrevolutionary Cuban society. Therefore, the curtailment of individual liberty and privacy is perceived by some as necessary to maintain adequate public health and safety.

Life in Cuba outside the sanitariums is difficult, as there are shortages of food, housing, electricity, and trans-

portation. Some residents had mixed feelings as to whether they would want to leave the sanitarium once phase IV is implemented. They weighed the benefits of adequate medical treatment, housing, peer support, and ample nutrition against the restrictions on freedom and the separation from their former community.

Educational Campaign

Some authors have criticized Cuba's lack of effort in AIDS education compared with its approach to screening and treatment.[12,15] Before 1989, Cuban AIDS education relied on European advertisements that were culturally foreign to most Cubans. Alternatively, they featured formally attired Cuban health professionals conversing in complicated medical terms. Recently several culturally specific education projects have been developed. In 1990 the Grupo Prevención SIDA [AIDS], comprising HIV-seropositive physicians, economists, psychologists, and laborers, collaborated with the National Center for Health Education to establish an information center in downtown Havana. Grupo Prevención SIDA also initiated street and university AIDS outreach programs. High-risk groups, such as "*rockeros*"—young people who are interested in rock music and who lead an "alternative" lifestyle—have been targeted by a newly formed multidisciplinary AIDS education consortium. A bimonthly two-hour radio program has been started that features music, interviews, and conversations with people who are HIV-positive.

In 1993 Grupo Prevención SIDA, many of whose members were residents in the sanitariums, was promoted to the status of a national commission charged with setting HIV educational policy and implementing national programs. Emphasis is placed on careful partner selection, safer sex practices, barrier use, and decreasing the number of sexual partners. Information on AIDS is now presented on television daily. The interviews we conducted with people in Havana consistently showed a high level of HIV awareness. There seemed to be an impressive knowledge of the modes of transmission and the demographics of the disease. Interviewees felt that the HIV prevalence was low and thought that all people with HIV were in sanitariums.

Economic Costs of Cuba's HIV Program

A total of 12% of the Cuban national budget is devoted to health care (Cosme Ordones, MD, written communication, May 1993). Expenditures for HIV-related issues have been estimated at $15 to $20 million (in US dollars) annually. The initial screening campaign required $1.7 million to purchase 42 spectrophotometers, 750,000 diagnostic tests, and laboratory materials. A total of $3 million was invested in the development of the Cuban ELISA and Western blot test. Tests now cost 22 cents each. The cost of maintaining a resident in a sanitarium is about $15,000 per year. These figures represent an estimate of some of the more obvious dollar costs required to implement and maintain the program. Further research is needed to analyze the full economic effects of the AIDS program.

Discussion

Cuba's National AIDS program is of particular interest because of its aggressive strategy to prevent the spread of HIV. Serious ethical questions exist regarding the restrictions placed on people with HIV. The current political reality of Cuba and its relationship with the United States can make it difficult for independent sources to collect accurate information. Therefore, some have questioned the validity of reports regarding the epidemiology of HIV in Cuba.[16-18] Although only limited outside research has been done, several investigators are convinced of the accuracy of HIV-related and other health care data.[12,19-21] During our three-week stay, we were impressed by our easy access to information. Although we cannot be absolutely certain, we think that the data that were given to us and that are presented in this article are accurate.

Over the past seven years, Cuba may have completed the most comprehensive national HIV serologic study in the world. It is unclear whether the HIV screening campaign has been an important factor in preventing the spread of HIV, but it is impressive that 55% of the people detected with HIV are asymptomatic. Of interest, there have been few documented occurrences of blood-borne or perinatal HIV transmission.

Cuba's well-developed public health system works to the advantage of the AIDS prevention program. Advances in health care are heavily promoted by the government and are often linked to revolutionary goals. In this context, screening for HIV may now be viewed as a routine part of a comprehensive medical examination. Since the revolution, there has been an aggressive public health response to communicable diseases such as tuberculosis. Strong government emphasis is placed on tuberculosis diagnosis, contact screening, and supervised chemotherapy at a primary care level. There are no known cases of tuberculosis among people with HIV. This may be due to the low incidence of tuberculosis in Cuba and the fact that people with HIV are relatively isolated and receive frequent medical attention.

The AIDS program relies on contact tracing. In addition to testing sexual partners, health workers also teach them about HIV transmission. In a country with an organized health care system, limited resources, low HIV prevalence, and a societal commitment to caring for those infected, contact tracing may provide an efficient method for HIV control. Although some persons who perceive themselves at risk for HIV infection may attempt to avoid contact with the health care system, Cuba's reliance on neighborhood physicians, its strong community organizations, and the lack of an underground drug culture may make it difficult to evade HIV screening. Cuba's economic crisis and the growth of prostitution and tourism may have serious adverse effects on AIDS prevention efforts.

The most controversial aspect of the AIDS program is the sanitarium policy. Criticism has focused on the efficacy and ethics of this abridgment of personal freedom.[14-18] Although restrictions on persons in the

sanitariums are lessening with time, they remain unacceptable to many people both inside and outside of Cuba. Cuba's response to the HIV epidemic may be better understood in the context of its social structure. Cuba is organized along greatly different principles from those found in many other countries. The interests of the state and community are placed before individual concerns. Residents of Havana with whom we spoke frequently expressed the view that collective well-being takes precedence over individual rights. In this context, because medical care and social support are guaranteed for all people diagnosed with HIV, and because the sanitarium system is perceived as being in the public interest, massive HIV screening and the use of sanitariums may be acceptable to most Cubans. It is questionable whether the use of sanitariums has played a major role in thwarting the spread of HIV in Cuba. Future studies and scientific exchanges may help clarify the contributions of factors such as the sanitarium system, Cuba's relative isolation, and the extensive screening program on the low incidence of disease.

Although some lessons may be learned from Cuba's comprehensive and coordinated response to HIV, many aspects of Cuba's policy are not acceptable or applicable in other countries. In many nations, the prevalence of HIV infection is much greater. The use of injection drugs is a compounding problem. Most societies would be unwilling or unable to impose widespread HIV screening on its citizens. Even if it could be demonstrated that the sanitarium policy has been efficacious, it is improbable that the restrictions to freedom of a sanitarium system would be acceptable in 1995. In countries with a large number of infected persons, there may be neither the consensus nor adequate public resources to provide economic support, housing, and health care for all people with HIV.

Restrictions on travel render scientific exchange between Cuba and other nations difficult. In the face of the global HIV pandemic, it is imperative to share knowledge regarding HIV epidemiology and all strategies that might prevent the spread of the virus.

REFERENCES

1. Mann J, Tarantola D, Netter T (Eds): AIDS in the World: A Global Report. Cambridge, Mass, Harvard University Press, 1992

2. World Health Organization: Weekly Epidemiol Record 1992; 67:97-104

3. Benjamin M, Collins JSM: No Free Lunch: Food and Revolution in Cuba Today. San Francisco, Calif, Institute for Food and Development Policy, 1984

4. Ubell RN: Twenty-five years of Cuban health care. N Engl J Med 1983; 309:1468-1472

5. Boffey PM: Health care as a human right: A Cuban perspective. Science 1978; 200:1247-1250

6. Pérez-Stable EJ: Community medicine in Cuba. J Community Psychol 1985; 13:124-137

7. Pérez-Stable EJ, Pedraza RO: Tuberculosis in Cuba. Am Rev Respir Dis 1984; 130:520-533

8. Lincoff NS, Odel JG, Hirano M: 'Outbreak' of optic and peripheral neuropathy in Cuba? JAMA 1993; 270:511-518

9. Cotton P: Cause of Cuban outbreak neuropathologic puzzle. JAMA 1993; 270:421-423

10. Report of the Meeting on Criteria for the Evaluation and Standardization of Diagnostic Tests for the Detection of HIV Antibody. Stockholm, Sweden, World Health Organization, Dec 1987

11. AIDS: 1987 revision of CDC/WHO case definition. Bull World Health Organ 1988; 66:259-263, 269-273

12. Pérez-Stable EJ: Cuba's response to the HIV epidemic. Am J Public Health 1991; 81:563-567

13. Centers for Disease Control: Revision of the surveillance case definition for acquired immunodeficiency syndrome. MMWR 1987; 36(suppl 1):3S-15S

14. del Pozo Marrero O: AIDS in Cuba (Letter). Lancet 1992; 340:374

15. Bayer R, Healton C: Controlling AIDS in Cuba: The logic of quarantine. N Engl J Med 1989; 320:1022-1024

16. Annas GJ: Detention of HIV-positive Haitians at Guantánamo—Human rights and medical care. N Engl J Med 1993; 329:589-592

17. Anderson WH: AIDS in Cuba (Letter). Lancet 1989; 2(8661):512

18. Moas C, Paya R, Gordon A: AIDS policy and HIV epidemic in Cuba. Int Conf AIDS 1990; 6:105 (Abstract No. FD 64)

19. Santana S, Faas L, Wald K: Human immunodeficiency virus in Cuba: The public health response of a Third World country. Int J Health Serv 1991; 21:511-537

20. Scheper-Hughes N: AIDS, public health, and human rights in Cuba. Lancet 1993; 342:965-967

21. Granich R, Sfeir M, Jacobs B: Detention of HIV-positive Haitians and Cubans (Letter). N Engl J Med 1994; 330:372