

# HIV/AIDS and Its Interaction with Tuberculosis in Latin America and the Caribbean<sup>1</sup>

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*At present, human immunodeficiency virus (HIV) is thought to have infected over 17 million people worldwide, over 1 million in North America and roughly 2 million in Latin America and the Caribbean. By comparison, infection with the tuberculosis (TB) agent Mycobacterium tuberculosis is far more common, current estimates indicating that roughly one-third of the world's population is infected.*

*These two infections tend to aggravate each other. That is, HIV leads to a progressive immune system depression that favors reactivation of TB in people with latent tuberculous infections; it promotes progression of TB primary infections or reinfections to full-blown tuberculous disease; and it fosters TB transmission, because those simultaneously infected with HIV and M. tuberculosis tend to develop a bacilliferous and contagious TB that can be transmitted to other susceptible individuals, even though the latter are HIV-negative. In addition, this coinfection tends to promote circulation of drug-resistant M. tuberculosis and to produce peculiar manifestations that complicate TB diagnosis, treatment, and control. Overall, it seems clear that the growing threat posed by these associated agents demands effective action in the form of well-coordinated measures involving thoroughgoing participation by all countries.*

**I**n 1981 acquired immunodeficiency syndrome (AIDS) was recognized in the United States for the first time as a new disease (1–4); and in 1983 a previously unknown virus, subsequently designated human immunodeficiency virus (HIV), was identified as the causal agent (5–6).

More broadly, large-scale dissemination of HIV around the world may have

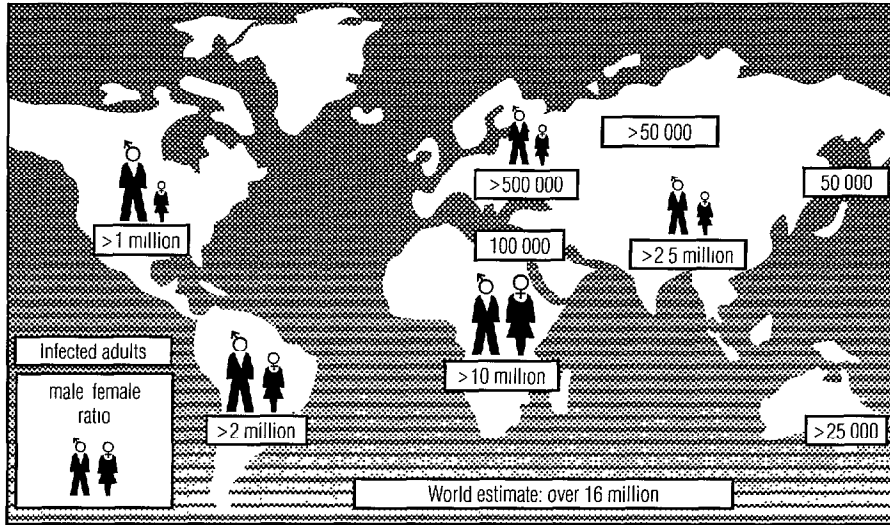
begun in the late 1970s or early 1980s. In the Americas, Australasia, and Western Europe the virus appeared in urban areas, primarily among men who had sex with other men and among individuals addicted to injectable drugs, such as heroin. It is quite probable, however, that in Sub-Saharan Africa the epidemic began a decade earlier as an infection transmitted sexually between men and women.

At present, as indicated in Figure 1 and Table 1, HIV is present on all continents. As of 1 July 1994, the World Health Organization's Global Program on AIDS (GPA) estimated that the number of people infected since the beginning of the pandemic had exceeded 17 million. Of this total, it was estimated that over 16 million cases involved adults while more than 1 million involved children (7). Also

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**Figure 1.** Estimated world distribution of total adult HIV infections from the late 1970s/early 1980s until mid-1994. *Source:* World Health Organization (7, 14).



as of 1 July 1994, a total of 985 119 AIDS cases had been reported to WHO, and the GPA estimated that all AIDS cases (reported and unreported) since the late 1970s totalled roughly 4 million (Figure 2).

As HIV has continued to spread by sexual transmission, the difference be-

tween the numbers of infected men and women has lessened. Currently, the number of men with HIV still exceeds that of women. However, the GPA estimates that by the year 2000 the number of new cases of infection in women will approximate that in men.

An important consequence of this greater rate of infection among women is an increased number of children who are born with HIV or acquire it during breast-feeding. There are currently over 1 million children who have acquired HIV by perinatal transmission (7). These children typically develop AIDS more rapidly than adults and generally die before age 5.

At the present time two types of HIV, designated HIV-1 and HIV-2, are known. Of the two, HIV-1 is more prevalent worldwide. However, HIV-2 appears to have spread during the 1980s, although to a lesser degree, primarily in West Africa. Sporadic infections produced by HIV-2 have also been recorded in East Africa, Europe, Asia, and Latin America. The transmission mechanisms for HIV-2 are similar to those for HIV-1, and both

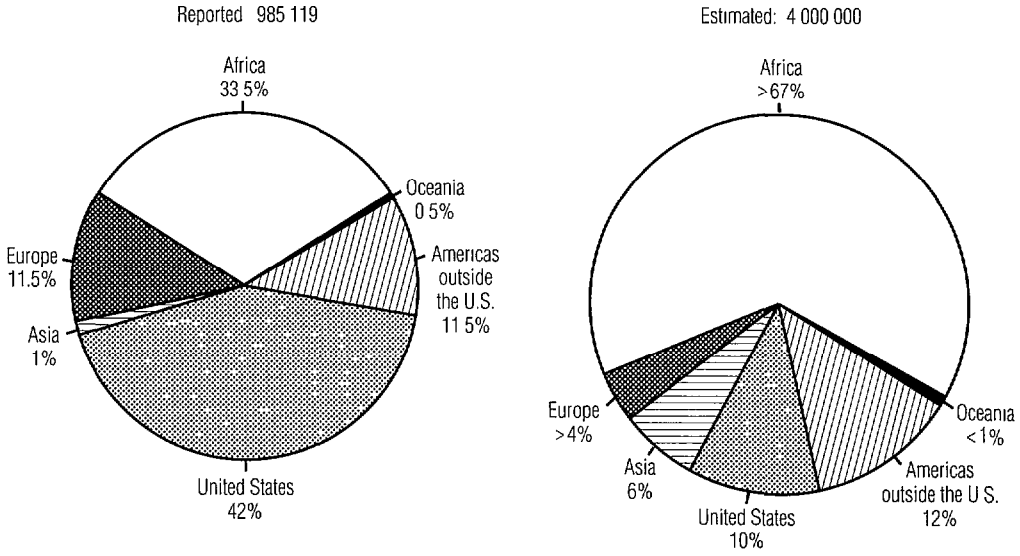
**Table 1.** World figures for the estimated numbers of accumulated HIV infections in adults, based on reports received by WHO through 30 June 1994.

Region	Estimated number of accumulated HIV infections in adults*
Australasia	>25 000
North America	>1 million
Western Europe	>500 000
Latin America and the Caribbean	2 million
Subsaharan Africa	>10 million
Southern and Southeast Asia	>2.5 million
East Asia and the Western Pacific	50 000
Eastern Europe and Central Asia	>50 000
North Africa and the Middle East	100 000
<b>World Total</b>	<b>&gt;16 million</b>

*Source.* Reference 7

\*Includes deaths.

**Figure 2.** The cumulative numbers of AIDS cases reported and estimated in adults and children worldwide from the late 1970s through June 1994. *Source:* World Health Organization (7).



viruses can cause AIDS with characteristics that are clinically indistinguishable. It is possible, however, that HIV-2 has a lower transmission capability, a longer incubation period, and less of a tendency to progress to AIDS.

The epidemiology of HIV cannot be understood without understanding its transmission mechanisms. The results of epidemiologic and laboratory research show that the three basic modes of transmission are sexual contact, blood transfusion, and perinatal transmission.

According to studies carried out on discordant couples (i.e., couples in which one individual is HIV-seropositive and the other is not), the probability of infection from exposure to body fluids (semen or vaginal secretions) in a single sexual contact oscillates around 0.1%; male to female transmission is more frequent than female to male (8). Among discordant couples using a condom for each sexual contact, the infection rate was 3.5 per 100 couple-years, while among those using condoms with a

lesser degree of regularity the rate was 10 per 100 couple-years (8).

Several case-control studies on associations between other sexually transmitted diseases (STD) and HIV have consistently shown a probability of viral infection between 2 and 18 times greater when the presence of another STD (syphilis, chancroid, gonorrhea, chlamydia, genital herpes, or trichomoniasis) is confirmed through laboratory tests or a physical examination (9, 10). This has underlined the importance of strengthening STD control measures, in addition to promoting the use of condoms.

Like certain other STDs, HIV infection can also be transmitted parenterally, most notably through transfusion of contaminated blood or blood products. In the latter cases, the probability of infection from exposure to infected blood exceeds 90%. As of 1993 it was estimated that 3% to 5% of all AIDS cases worldwide were attributable to HIV infections acquired in this manner.

At present, safe transmission of blood and blood products is being achieved through careful selection of donors, elimination of remunerated blood donations, and reduction of unnecessary transfusions. From a technical standpoint, elimination of transmission by blood transfusion is an easier goal to achieve than cessation of individual and social high-risk practices and behavior.

HIV is also transmitted, although less frequently, by the use of unsterilized skin-puncture instruments and invasive procedures, whether in a health setting (nosocomial transmission, generally from patient to patient) or elsewhere. A serious problem in all countries, whether industrialized or not, is HIV transmission among users of injectable drugs employing needles or syringes contaminated with infected blood.

Transmission of HIV from mother to child includes transmission during pregnancy, childbirth, and breast-feeding. It is estimated that the percentage of mothers with HIV who infect their children ranges between 7% and 39% (about 15% in Europe and 30–35% in Africa), but these figures vary considerably from one research study to another. Among the factors associated with an increased rate of perinatal infection are recent infection of the mother, an advanced state of clinical or immunologic deterioration in the mother, premature childbirth, breast-feeding, and the presence in the blood of the p24 antigen (a HIV peptide with an approximate relative molecular mass of  $24 \times 10^3$ ). Infection is acquired primarily in the final three months of pregnancy and during childbirth (11).

Turning to another matter, it seems clear that the interval between infection with HIV and the onset of clinical symptoms is quite long compared to that of most other communicable diseases and varies considerably from one individual to another. Close to 50% of all those infected

become ill within 10 years of infection. However, those individuals who remain asymptomatic for a long period of time appear to possess characteristics distinguishing them from those who progress rapidly toward development of AIDS. Specifically, they exhibit less destruction of CD4 cells through the action of cytotoxic cytokines; they produce neutralizing antibodies against HIV; and they possess CD8 cells with intense antiviral activity (11).

A number of different factors intervene as the infection progresses toward appearance of clinical symptoms. Some strains of HIV are more pathogenic than others. Certain genetic factors and other host characteristics can affect the rate at which a given individual develops the disease. Convincing evidence has shown that small children and adults over age 40 progress more rapidly toward the disease than younger adults. Persons infected parenterally or those who were inoculated with a very large dose of the virus tend to have a shorter incubation period.

Once the individual has developed AIDS, the average time of survival is between one and three years. In industrialized countries, however, longer survival periods are being observed—possibly as a result of the use, beginning in 1987, of azidothymidine (AZT) and the administration of treatments designed to prevent the most common opportunistic infections.

## **HIV/AIDS EPIDEMIOLOGY IN LATIN AMERICA AND THE CARIBBEAN**

Of the 985 119 AIDS cases officially reported as of 30 June 1994 by WHO Member Countries, over 50% were from North America, Latin America, and the Caribbean—421 418 from North America and 102 359 from Latin America and the

Caribbean. It is quite probable, however, that the actual number of cases accumulated over the past 12 years is considerably greater than these official figures. For instance, it is estimated that in Latin America and the Caribbean alone the cumulative number of AIDS cases occurring since the late 1970s exceeds 400 000 (7, 12).

In addition, a number of different analytic methods have estimated the number of adult HIV carriers alive in mid-1994 in the Americas in excess of 2.3 million, although the great majority of these people do not yet present the characteristic manifestations of AIDS. Of these infected individuals, over 1.5 million are believed to be in Latin America and the Caribbean, where the infection apparently continues to spread rapidly within the heterosexual population (7).

The estimated and projected figures for infected adults throughout the world point to a possibility that Latin America will witness a slight decline or leveling off in the HIV transmission rate beginning in the mid-1990s and continuing through the year 2000. On the other hand, the estimated and projected numbers of AIDS cases will exhibit an upward trend during the whole of the 1990s, despite a leveling off in the number of new HIV infections, as a result of the disease's long incubation period.

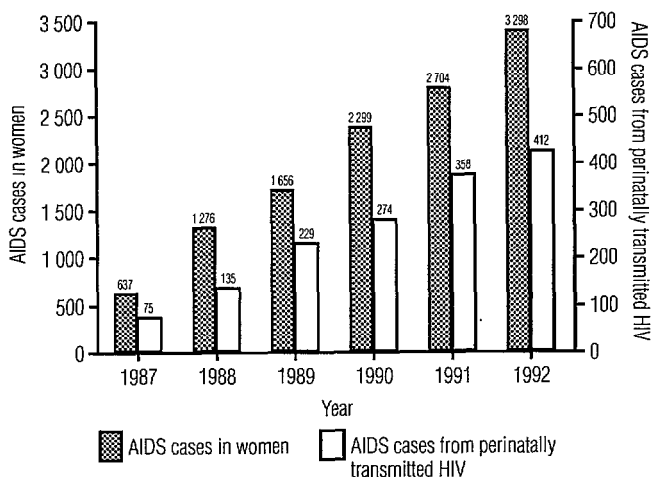
To judge by risk factor data available on reported AIDS cases in the various subregions of Latin America and the Caribbean, there is a general trend toward stabilization and decline in the numbers of cases caused by sexual contact between men and a sharp increase in the numbers of cases caused by heterosexual contact. More AIDS cases have been reported in the Caribbean from heterosexual contact than from homosexual or bisexual contact since 1987, and in Central America the same phenomenon has been observed since 1988. In the other subregions, AIDS cases attributable to homosexual or bisex-

ual contact continue to be more numerous than those attributable to heterosexual activity; but a pronounced increase in the latter and a levelling off or decline in the former in recent years suggest that in two or three years the number of AIDS cases arising from heterosexual contact will be greater than the number arising from homosexual or bisexual contact. When AIDS' long incubation period is taken into account, it seems clear that most individuals currently being infected in the Region are becoming infected through heterosexual contact.

The HIV infection ratio for men and women is currently estimated at 4.3:1 in Latin America and 2.2:1 in the Caribbean. However, the ratio is as low as 1:1 in some subregions and much higher in others (as high as 12:1 in the Andean subregion) where male infections still tend to predominate (13). Even so, for several years the overall ratio has shown a downward trend due to the increased cases reported among women and the subsequent increase in mother-to-child transmission. In some countries, a progressive increase in the number of AIDS cases among women and also among children under age two has already been detected (Figure 3).

Active monitoring of HIV infection in patients seeking care at STD clinics in various parts of the Region suggests that 2% to 14% of these women may be infected with the virus. Studies conducted on pregnant women seen at prenatal care clinics from 1990 to 1992 found HIV prevalences on the order of 1.3% in Santo Domingo, Dominican Republic; 2.9% in the Bahamas; 3.0% in Santos, Brazil; 4.0% in San Pedro Sula, Honduras; and 8.0% to 10.0% in Haiti. Another indication that the pandemic is impacting the general population has been provided by a 1991 study that found a HIV prevalence of 0.6% among municipal employees in Guatemala City (14).

**Figure 3.** Cases of AIDS among women and cases of perinatal AIDS transmission in Latin America and the Caribbean, 1987–1992.



HIV infection among individuals addicted to injectable drugs is also a growing problem, at least in certain countries. Examples include Argentina, where the HIV prevalence among those surveyed in this group has been in the range of 30% to 50%, and Brazil, where the observed rate in survey subjects has fluctuated between 20% and 60% (15). For the Southern Cone countries (Argentina, Brazil, Chile, Paraguay, and Uruguay) taken as a whole, approximately 25% of those with reported AIDS cases have been found to use injectable drugs, making this the second most important risk factor after homosexual or bisexual contact (15).

In Mexico, use of injectable drugs has been identified as the third most important risk factor in HIV transmission, following homosexual and bisexual contact and heterosexual relations. However, 15% of the 14 823 accumulated AIDS cases reported through September 1993 have been attributable to blood transfusions. Development of a safer blood supply following 1987 legislation prohibiting commercial payments for blood donations appears to have reduced this type of

transmission; such a reduction can be demonstrated graphically three or four years after promulgation of the law.

In some developing countries, HIV transmission via contaminated blood accounts for at least 10% of all AIDS cases, more among certain population groups. For example, 14% of all AIDS cases reported in Mexico in 1991 appeared to be the result of blood transfusions, but among women this type of transmission accounted for more than two-thirds of all cases. In the Dominican Republic, blood transfusions appear to account for about 5% of all AIDS cases and for about 35% of those reported among women between the ages of 25 and 35 (16).

## TUBERCULOSIS

### Epidemiologic Background

In April 1993 the World Health Organization declared tuberculosis (TB) to be a world health problem and warned that the number of deaths from this disease would reach 30 million by the next decade if the necessary control measures were

not taken. Although tuberculosis is a recently reemerging public health problem in certain developed countries, it has never ceased to be a major problem in developing countries. WHO has estimated that one-third of the world's population (1 722 million individuals) is infected with *Mycobacterium tuberculosis* and that 8 million new cases of active TB occur annually. Of these, 3 million result in death despite the availability of effective antituberculosis drugs (17).

Ninety-five percent of the new cases and 98% of the deaths occur in developing countries, where TB is one of the primary causes of death among adults. Unlike the situation in more industrialized countries, the disease affects the general population, most of the ill being young adults and children exposed to the contagion perinatally and during infancy (18).

*M. tuberculosis* undergoes airborne transmission, being spread almost exclusively by individuals who have the disease and yield positive bacilloscopy results. More specifically, TB bacilli are spread through oro-nasal secretions expelled by individuals with active cases of the disease when coughing, sneezing, speaking, and so forth, that penetrate into the respiratory tracts of people with whom they come in contact. Initial penetration of the bacilli into the organism, which normally occurs in the lungs, causes a primary infection characterized by inflammatory, exudative, and productive processes (the primary complex) of a very localized nature.

Following this primary infection, most individuals (90%) progress toward a spontaneous cure in a matter of weeks and will show no signs of clinical progression, because a properly functioning immune system is able to respond effectively to the invasion. However, sooner or later a portion of those individuals with primary complexes will develop symptoms of illness. The slower and less ef-

ficient the immune response, the greater will be the spread of the infection.

Among HIV-infected individuals, the immunodeficiency produced by the HIV virus is the primary risk factor increasing the likelihood that TB symptoms will appear. In addition, besides being one of the most frequently occurring opportunistic diseases in cases of acquired immunodeficiency, TB is the only such disease whose communicability (via the respiratory tract) makes it an important public health problem.

One of the principal current fears is that TB will become an incurable disease as a result of the emergence, in recent years, of *M. tuberculosis* strains resistant to drugs in common use.<sup>3</sup> Typically, the organism becomes resistant when the administered treatment is inadequate or interrupted—as tends to be the case when antituberculosis programs are poorly administered or lack sufficient human and economic resources.

### **Tuberculosis in Latin America and the Caribbean**

Tuberculosis has never ceased to be a serious health problem in Latin America, where some 230 000 cases of the disease in all of its forms are reported annually. (The actual incidence may be as high as 500 000 cases per year.) To these figures it is necessary to add a significant number of chronic pulmonary TB cases (19).

The prevalence of endemic TB varies considerably from one country to another—depending on such general circumstances as the degree of socioeconomic development, political stability, and the development of health services in general, as well as on the specific nature

<sup>3</sup>World Health Organization. *WHO attacks global neglect of tuberculosis crisis*. Geneva: WHO; 1993. (Press release WHO, 12 November 1993.)

of the TB control program. Other factors exercising an important negative influence are limited health care facility coverage and use; lack of needed health resources; irregular distribution and use of such resources; weakening of TB control programs; population growth and migratory habits; and, beginning in the late 1980s and early 1990s, the initial consequences of the spread of HIV infection.

As indicated in Table 2, the status of the endemic may be classified as extremely serious, serious, or mild to moderate in different countries, in accordance with levels of contagious case morbidity, trends observed over the past decade,

and the coverage and efficiency of intervention activities in each country.

In most Latin American countries the reported TB morbidity only accounts for 40% to 70% of the estimated cases, indicating that a significant portion of the population of these countries is excluded from program benefits and that in some countries a large number of those ill remain contagious for long periods of time. Morbidity and its trends are typically determined by the degree to which circumstances such as these are present (19).

The TB problem is classified as extremely serious in Bolivia, the Dominican Republic, Ecuador, El Salvador, Guate-

**Table 2.** Incidence of pulmonary tuberculosis (TB), according to the number of cases confirmed by bacilloscopy, in countries of Latin America and the Caribbean, 1990–1992.

	1990		1991		1992	
	No. of cases	Rate per 100 000	No. of cases	Rate per 100 000	No. of cases	Rate per 100 000
<i>Countries with an extremely serious TB problem:</i>						
Bolivia	6 676	119	6 621	120	8 274	124
Dominican Republic	1 551	21.6	1 048	14.2	1 853	24.6
Ecuador	4 151	42	4 101	42.5	4 946	44.7
El Salvador	1 422	27	1 650	30	1 943	36
Guatemala	2 076	22.5	2 058	21.8	1 628	16.7
Haiti	5 619	101	5 315	94	5 346	92
Honduras	2 355	49	2 632	54	2 393	49
Nicaragua	1 478	38	1 434	35.8	1 529	37
Peru	24 023	111	23 074	104	32 130	143
<i>Countries with a serious TB problem:</i>						
Brazil	37 934	27.5	41 401	26	41 949	26.5
Colombia	8 090	24.5	8 074	24	8 032	23.4
Mexico	13 089	16.1	12 554	14.4	11 263	12.7
Panama	799	32	824	33.4	714	28.4
Paraguay	993	23.2	943	21.4	860	19
Venezuela	3 358	17.3	3 086	15.6	3 272	16.16
<i>Countries with a mild or moderate TB problem:</i>						
Argentina	5 939	18.3	5 829	18	6 318	19.4
Chile	2 773	21.5	2 565	19.1	2 456	18.1
Costa Rica	225	7.5	319	10.3	178	5.6
Cuba	590	4.6	440	4	533*	5
Uruguay	525	16.7	485	15.4	418	13.2

\*Calculated on the basis of the total number of cases reported.



mala, Haiti, Honduras, Nicaragua, and Peru (19) (see Table 2). Some of these countries have very high actual TB incidence and prevalence rates; others have moderate or even low reporting rates. In all of them, however, an analysis of TB control programs has revealed that diagnostic coverage is minimal, that any downward trends in incidence and prevalence are very slight, and that in most cases these rates have increased, owing possibly to improved case identification. In all the countries listed, which have a total population of 87 million, a major effort is being made to organize TB programs and improve them from an operational standpoint.

The tuberculosis pandemic is classified as serious in Brazil, Colombia, Mexico, Panama, Paraguay, and Venezuela (19). These countries, with the exception of Brazil and Mexico, are included in this group because they are estimated to have moderate or high rates of TB with a slight or nonexistent downward trend, and because the organization and operation of their TB programs are so poor that these programs fail to benefit large parts of the population. Socioeconomic and institutional development in most of these countries is better than this classification might suggest, and it is possible that Colombia, Panama, Paraguay, and Venezuela will be able to overcome a large share of their difficulty by means of relatively small initiatives supported by political and budgetary decisions.

The situation in Brazil and Mexico is different. These two countries have a combined population of some 240 million inhabitants; an enormous surface area; very extreme and varied situations with regard to the population's dispersion, urban concentration, and economic development; and significant portions of their populations living in poverty. TB incidences recorded in Brazil are moderate and show a slow downward trend, though

a significant percentage of cases may have been omitted. In Mexico, reported TB incidences are remarkably low and reflect a significant downward trend, but the persistence of limited diagnostic activities and underreporting of cases point to the possibility that official figures could be two to three times lower than the actual ones.

These countries where the TB situation is serious have a total population of 301 million. Despite the fact that morbidity in these countries is generally low, large parts of their populations are exposed to a moderate risk of infection, and a variable percentage of the population in each country is at high risk of infection, sickness, or death from TB.

The tuberculosis pandemic is classified as mild to moderate in a small group of countries with a combined population of 59 million, these being Argentina, Chile, Costa Rica, Cuba, and Uruguay (19). In general, social and economic development has progressed better in these countries than in the rest of Latin America. The observed incidences of bacilliferous cases (see Table 2) are in the average range in Argentina, Chile, and Uruguay and very low in Costa Rica and Cuba. In general, the downward incidence trends observed over the past decade continue to exceed 5% per annum. Except in certain transient situations, TB control programs have been characterized by permanence, consistency, nationwide coverage, and acceptable levels of efficiency. In addition, there are very few population segments that are classified as marginal. Only in a few provinces and regions of Argentina and Chile (the two largest countries) are TB problems extremely serious in certain rural areas and, possibly, in the marginal neighborhoods of some of the larger cities.

In the Caribbean, TB reporting rates are low, with less than 20 cases, or even less than 10 cases, generally being reported per 100 000 inhabitants. The rates

reported generally reflect a slight downward incidence trend. Care is both individualized and specialized, and there are no control programs operating such as those that have been developed in Latin America. In some Caribbean countries the situation may be worse than that reflected by official figures. Recently, efforts have been made to expand the information available on TB status and control in the Caribbean and to establish activities for developing and improving national control programs.

## INTERACTION BETWEEN HIV AND TB

The true dynamics and magnitude of the HIV/AIDS epidemic cannot be grasped without understanding the interaction between the infections caused by HIV and *M. tuberculosis*. That is because, aside from its other adverse effects, HIV infection is a risk factor that aggravates the TB epidemiologic picture, especially in developing countries. Some 30% to 50% of the adults in these countries have latent tuberculosis infections, because they were infected by *M. tuberculosis* at some time in their lives but never developed clinical TB. HIV leads to a progressive immune system depression that favors reactivation of TB in individuals with latent tuberculosis infections, as well as a progression to full-blown tuberculous disease in individuals with tuberculous primary infection or reinfection. In addition, it has been shown that tuberculous disease aggravates the course of HIV infection.

The interaction between these two pathogenic agents is strengthened by the overlapping of population groups infected by HIV and *M. tuberculosis*. On the average, out of every 1 000 individuals infected only with *M. tuberculosis*, two per year will develop tuberculous disease. However, in individuals infected simultaneously with *M. tuberculosis* and HIV,

the annual rate of progression toward tuberculous disease is 80 per 1 000 individuals infected, 40 times the rate found in individuals free from HIV infection (20). Furthermore, HIV-positive individuals who contract a primary tuberculous infection are at high risk of developing primary disseminated and progressive TB.

But the greatest TB risk goes beyond HIV-positive individuals. That is because those simultaneously infected with HIV and *M. tuberculosis* tend to develop a bacilliferous and contagious TB that can be transmitted to other susceptible individuals, even though the latter are HIV-negative. Indeed, in some communities this process is already producing an increase in the number of TB cases in HIV-negative individuals.

In sum, the HIV epidemic can be expected to aggravate the TB situation in developing countries by means of the three following mechanisms: (1) reactivation of latent tuberculous infection in individuals with HIV infection; (2) increased vulnerability to new infection with the TB bacillus and rapid progression toward active disease among individuals with HIV infection; and (3) an increase in the number of TB cases within the general population as a result of TB transmission by HIV-positive individuals with tuberculous disease.

To all of the above must be added the fact that the association between HIV and *M. tuberculosis* has peculiarities that complicate the treatment and control of both TB and AIDS. These peculiarities include the following: (1) greater difficulty diagnosing TB as a result of the presence of nonspecific or atypical types (with the appearance of extrapulmonary and disseminated forms); (2) a smaller number of positive results from bacilloscopies and sputum cultures; (3) disappearance or abatement of the cutaneous reaction to purified protein derivative (PPD) of *M. tuberculosis*; and (4) uncharacteristic X-ray im-

ages. In the United States, nosocomial outbreaks of TB caused by multiresistant bacilli have been described. These outbreaks occurred primarily in HIV-positive patients who developed severe and very lethal forms of TB. In addition, several Latin American countries have reported the presence of multiresistant strains in tuberculosis patients with AIDS (21).

## COINFECTION WITH HIV AND *M. TUBERCULOSIS*

WHO estimates that from the beginning of the AIDS epidemic through mid-1993 the worldwide total of individuals infected simultaneously with HIV and *M. tuberculosis* was about 5.1 million.<sup>4</sup> It is expected that by 1995 there will be approximately 0.5 million cases of active TB as a result of the HIV virus, and that by the year 2000 this figure will reach 1 million.

Within the Americas, PAHO has estimated that in June 1993 the cumulative number of adults infected with HIV in Latin America and the Caribbean was approximately 1.5 million and that at the time there were some 117 million persons infected with *M. tuberculosis*, the annual figure for new cases of active TB being close to 500 000. In this vein, it has been estimated that as of 1992 a total of about 330 000 people in Latin America and the Caribbean were simultaneously infected with HIV and *M. tuberculosis* (21).

## CONCLUSIONS

The growing magnitude of the AIDS problem, resurgence of TB, emergence of TB forms resistant to the commonly used antituberculosis drugs, and an increase in TB among population groups not infected by the HIV virus have occurred because a rapid and effective worldwide

response to the HIV/TB problem has been lacking. We now know that in order to address the problem of TB and its association with HIV/AIDS, answers must be found to a series of concrete questions regarding the interaction between their causal agents; for example: Within any given country, what are the current HIV/AIDS and TB situations and what trends do they exhibit? To what extent have extrapulmonary forms of TB increased over time? What is the seroprevalence of HIV infection among individuals that have become ill with TB? To what extent has the appearance of *M. tuberculosis* strains resistant to antituberculosis drugs increased? What is the frequency of TB as an opportunistic disease in AIDS patients? What therapeutic management should be provided for patients infected simultaneously by HIV and *M. tuberculosis*, and how effective is such treatment in view of primary and secondary drug resistance? What clinical trials should be conducted to study antituberculous chemoprophylaxis in HIV-seropositive patients? And what behavior should be adopted by each country with regard to standardized serology for HIV screening of individuals infected with TB?

PAHO deems it essential to know the situation and to give broad distribution to the information generated in the various countries, with a view to alerting the health community and enabling it to take steps needed to contain the AIDS and TB epidemics inside and outside the Americas—the growing AIDS epidemic and the reemergence of TB have become pressing world problems that will be impossible to control without measures that include participation by all countries.

To help address this need, the Regional Program on AIDS and STD of the PAHO Division of Communicable Disease Prevention and Control, in collaboration with groups of experts from various countries, has prepared a series of

<sup>4</sup>World Health Organization. *WHO attacks global neglect of tuberculosis crisis*. Geneva: WHO; 1993. (Press release WHO, 15 November 1993.)

reports describing the current association between the infections and diseases caused by HIV and the tubercle bacillus. These reports will be published in this journal's Spanish-language counterpart, the *Boletín de la Oficina Sanitaria Panamericana*, and appropriate coverage will also be provided in English. The overall aim will be to give national TB and HIV/AIDS control programs useful information that will help them to take immediate action, and to give health professionals and technicians confronting the HIV/TB association an effective overview of the situation prevailing in the Americas.

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