

# TUBERCULOSIS CONTROL IN THE AMERICAS: CURRENT APPROACHES<sup>1</sup>

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*It is now 30 years since the development of tuberculosis chemotherapy, but the hope it raised for eradication of the disease is yet to be fulfilled. Tuberculosis remains a public health problem, to a greater or lesser extent, in all the countries of the Americas.*

## Epidemiologic Extent of the Problem

In 1973 a total of 34,500 new cases of tuberculosis (that is, not counting reactivated cases) were reported in Canada and the United States of America—15 for every 100,000 inhabitants in these countries (1,2). In that same year the number of reported deaths from the disease was 4,282, or 1.8 per 100,000 population. The statistics, however, mask the true lethal effect that this scourge still has in the technologically more advanced countries of the Hemisphere, since they fail to show the number of persons who had active tuberculosis at the time of death but were suffering from some other disease or condition attributed as the main or immediate cause. Even so, in the United States tuberculosis has been the number one cause of death among the reportable communicable diseases, and the second cause among all communicable diseases, surpassed only by pneumonia. The prevalence of infection in the population six years of age is 0.2 per cent, the annual risk of infection being slightly under 0.02 per cent.

<sup>1</sup>Adapted from paper presented by K. Western at XXIII International Conference on Tuberculosis (Mexico City, September 1975); also appearing in *Bol Of Sanit Panam* 80(4):281-287, 1976.

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Although the overall epidemiologic picture shows that the levels in these two North American countries are among the lowest in the world, relatively high indexes continue to persist in some areas. In Washington, D.C., for example, the rate of new cases in 1973 was 41.2 per 100,000 population (3).

In Latin America the epidemiologic situation is at least 10 times worse than in Canada and the United States. In 1973 a total of 171,275 cases were reported in 20 countries, for a rate of 59 per 100,000 population (4). Moreover, we know that there are serious deficiencies in the statistical data, which means that these figures underestimate, perhaps by far, the real magnitude of the problem. Although the denominator represents the entire population, the numerator must necessarily be taken from that 75 per cent which has access to health establishments. The extremely high incidence of tuberculosis in some areas—up to 600 bacteriologically confirmed cases per 100,000 population—indicates a situation even more serious than that which existed in many places before the era of chemotherapy (5). In 1972, or the latest year for which information was available, the number of deaths in Latin America, excluding Brazil, was 29,531, for a rate of 15.5 per 100,000 population (6).

Increasingly widespread coverage of BCG vaccination programs has hindered the periodic measurement of tuberculin sensi-

tivity in children; as a result, for many areas in Latin America there is no information available on recent trends in the risk of infection or on current levels thereof. Data from some countries indicate that the prevalence of infection ranges from 4 to 10 per cent in children entering primary school (7,8).

The trends in reported cases and deaths from tuberculosis in North America, Middle America, and South America over the period 1953-1975 are shown in Figure 1.

### Evolution of Control Methods

Thirty years ago the proof of BCG vaccine's immunizing capacity was scant and inconclusive, and there were still profound differences of opinion in regard to its safety. At that time bacteriologic diagnosis was considered too slow and unwieldy, and there was no known chemotherapeutic agent that could effectively prevent, slow down, or inactivate the

disease. Efforts were focused on hospitalization in isolated institutions with highly specialized medical care and on the early spotting of minimal forms of pulmonary tuberculosis through systematic x-raying of the entire community. It was the period of sanatoriums in the mountains and tuberculosis clinics in the cities, whose work was extended by mobile x-ray units circulating throughout the community. This highly costly system of organization, despite efforts to implant it in all the countries of the Hemisphere, only managed to become fully established in places where there was a high degree of social and economic development. Its effect on the tuberculosis problem remained to be conclusively demonstrated. Certainly in the less-favored countries there was a vast abyss between the real tuberculosis problem and the expensive solutions that were offered by the technical know-how of the time.

A new phase began to get underway in the mid-1940's. The discovery of effective antibiotic and chemotherapeutic agents sparked hopes for a stepped-up march toward eradication of the Great White Plague. Also, in this same decade the results of the Aronson experiment (9) in North American Indians scientifically demonstrated the protective value of BCG vaccine in man and opened the way for the large-scale studies in the United States and Great Britain that have contributed so greatly to current knowledge on the effectiveness of this vaccine.

The old specialized vertical organization of sanatoriums, tuberculosis clinics, and mobile equipment, based on the traditional approaches such as prolonged hospitalization and systematic x-raying of the entire population, continued to operate up through the 1950's and into the early 1960's, but at the same time modern control methods—chemotherapy, chemoprophylaxis, and BCG vaccination—were being increasingly applied.

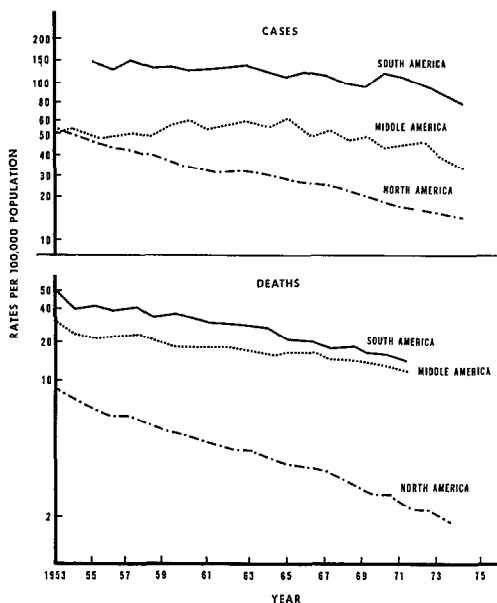


Figure 1. Reported cases and deaths from tuberculosis in the Americas, 1953-1974.

### The Current Approach to Control

Still, the tuberculosis indexes failed to decline as fast or as steeply as had been predicted. During the 1960's the pace of the decline slowed down progressively, especially in Latin America. The principal reason seemed to be the impossibility of extending control measures to the majority of the population in these countries through the traditional organizational structure. The clinics in the large cities and the mobile units were very restricted in terms of the population they could reach and the continuity of the services rendered. There was a wide gap between what was known and what was being applied in the tuberculosis programs.

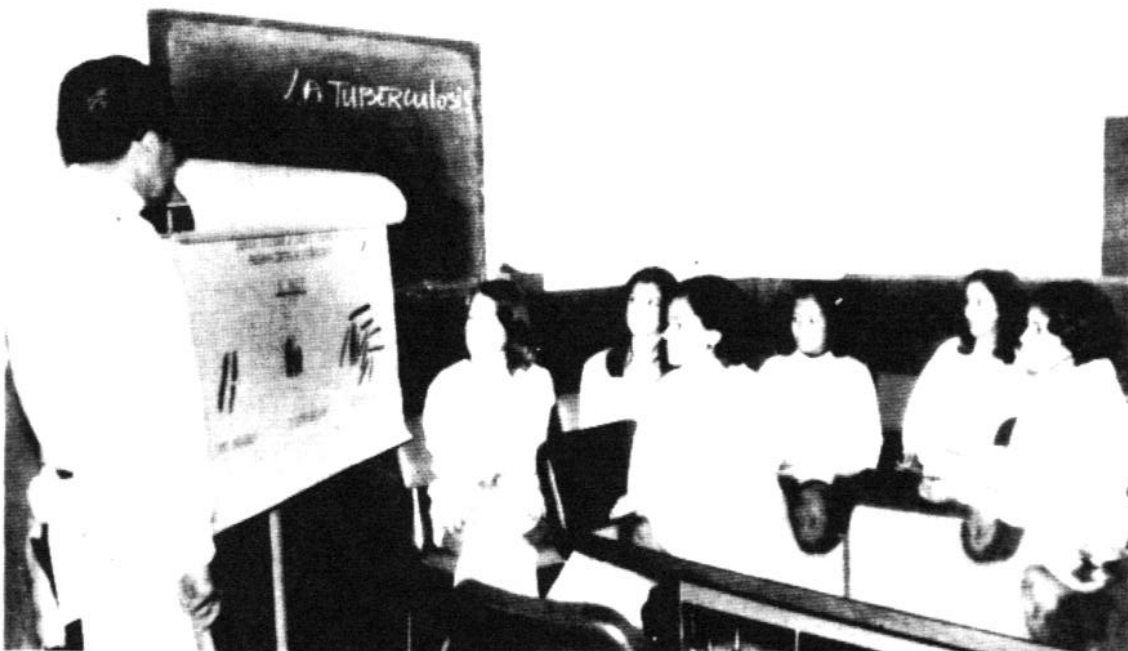
It was at about this time that the doctrine of *integration* of tuberculosis activities into the general health services emerged. The idea was to turn these activities over to programs that were national in coverage, offered continuity, and could be effective in acting against the problem at a cost compatible with the resources available. Simplification and standardization of control methods made it possible for them to be delegated to auxiliary personnel in rural health centers, thus overcoming the diffi-

culties imposed by the shortages of university-trained professionals and of financial and material resources in the developing countries.

At first many thought that integration would only be applicable in countries with limited resources. However, despite the clear differences between the developing and the developed countries, integration has become the current strategy in the latter as well. The situation was characterized very well by the WHO Expert Committee on Tuberculosis at its IX Meeting (Geneva, December 1973):

The program must be integrated in the community health structure. . . . It must be developed as a well-balanced component of the country health program and within the available resources. Attempts to establish an independent specialized service for tuberculosis are irrational in developing countries. Such a service would absorb a disproportionate share of the limited trained manpower and financial resources available, at the expense of other essential health services. It is equally irrational to maintain specialized tuberculosis services in countries where the problem has been greatly reduced (10).

At the III Special Meeting of Ministers of Health of the Americas (Santiago, October 1972) all the Governments of the Hemisphere agreed that integration of tubercu-



*General health service personnel are being trained to assume routine tasks in the tuberculosis program.*

losis programs into the overall health service structure would be their official strategy over the next 10 years (11). This position was reaffirmed shortly afterwards at the II Regional Seminar on Tuberculosis (Bogotá, November 1972), which brought together heads of tuberculosis programs from countries throughout the Americas, including Canada and the United States (12).

The movement toward integration has, in fact, recently gained special impetus in Canada and the United States. Every day the concept of treating the tuberculosis patient in general hospitals and on an ambulatory basis through the regular health services is being increasingly accepted and put into practice (13,14). Almost 80 per cent of the new cases diagnosed in the United States are found in patients who voluntarily sought medical advice because of their symptoms (15). Budgetary savings and reduction of the problem to lower levels are not the only considerations that have led the developed countries to opt for integration of tuberculosis activities; technological advances have demonstrated that the traditional approach to control is without scientific basis. To begin with, systematic x-raying of the population every two or three years offers no assurance that infection-disseminating cavitory forms of the disease will not appear (16). Moreover,

tuberculosis chemotherapy is now so effective that hospitalization is only rarely necessary. And finally, transmission of the tubercle bacillus is recognized to come most often from unknown sources, i.e., patients who have yet to be diagnosed and to initiate therapy (17).

Many places in Latin America continue to have the specialized vertical organization with tuberculosis sanatoriums and clinics, the general health infrastructure being quite separate from activities for the prevention, diagnosis, and treatment of this disease—simple activities that could so easily be carried out by polyvalent staff in the basic health services.

In 1974 the Pan American Health Organization and the Latin American Regional Committee for the International Union against Tuberculosis conducted a survey to determine the current status of integration of tuberculosis control activities into the public health services. Of 17,085 institutions polled in 16 different countries, fewer than half had already incorporated these activities into their general routine. BCG vaccination was being carried out by 27.5 per cent of the hospital-based services, 38.5 of the health centers with a regular staff physician, and 4.5 per cent of the rural units attended by nurses under periodic medical supervision. The figures on those conducting sputum smear examination

*BCG vaccination of newborns is an important feature of tuberculosis control programs in many countries.*



followed a similar pattern: 27.2 per cent of 3,663 hospital-based services; 41.8 per cent of 9,590 physician-staffed health centers, and 15.1 per cent of 2,932 minimum rural units. Fewer than 25 per cent of the new cases diagnosed in Latin America are reported by the general health services; the services specialized in tuberculosis or chest diseases are still the main source of reported cases. In terms of budget, most of the expenditures for control of the disease correspond to hospitalization costs. In 10 Latin American countries an average of 70.8 per cent of the tuberculosis budget in 1973 went for hospital beds, while only 5.2 per cent was spent on BCG vaccination, diagnosis, and treatment as activities integrated into the general health services.

The delay with which integration is being

put into effect in the developed and the developing countries may be attributed to a number of factors: in both instances, resistance on the part of specialized personnel to accept standardization of control methods and to delegate this work to polyvalent health personnel, and, contrariwise, resistance on the part of the polyvalent staff to take on new duties and responsibilities; in the developed countries, force of tradition; and in the developing ones, weakness of the health structure, shortage of personnel and funds, and limited support services available (statistical, nursing, laboratory, etc.). The difficulties are not insurmountable, however. A number of countries in Latin America have organized integrated national programs and are already showing promising results.

#### SUMMARY

Tuberculosis remains a serious public health problem in the Americas, and it has not declined as rapidly or as much as experts projected it would in the 1940's.

Scientific advances in control of the disease over the last three decades have produced effective chemotherapeutic agents, established the immunizing capacity of BCG vaccine, and demonstrated the superior value of bacteriologic diagnosis in symptomatic individuals over mass community x-ray surveys, which are both inefficient and costly. They have also shown that most cases can be treated on an ambulatory basis,

obviating the need for the lengthy hospital stays which have heretofore weighed so heavily on budgets. By standardization of control methods, both for diagnosis and for chemotherapy, these tasks can be taken on by polyvalent staff in the general health services, whose wide coverage places them in a position to reach a much larger segment of the population than that attended by the traditional vertical system. To a greater or lesser degree, all the countries in the Americas are beginning to orient their strategies in this direction, and some of them already have considerable progress to report.

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### TUBERCULOSIS IN THE U.S.: 1974-1976<sup>1</sup>

For the first six months of 1976 a total of 16,666 cases of tuberculosis in the United States of America were reported to the U.S. Center for Disease Control, compared with 17,045 for the preceding six-month period and 16,509 for the first six months of 1975. In 1974 a total of 15,444 cases were reported for the first six-month period and 14,829 for the remainder of the year.

The apparent reversal in 1975 of the long-term downward trend was due primarily to the implementation of recommended changes in criteria for reporting the disease: "reactivations" are now included in the incidence figures, as are certain other types of cases which were formerly not counted. Thus, if only the data since this change are counted, the cases for the first half of 1976—only 1 per cent more than those for the same period in the previous year and 2.2 per cent less than those for the six months immediately preceding—indicate a leveling off. The Center for Disease Control expects that the downward trend will be resumed in 1976-1977.

<sup>1</sup>Source: *Weekly Epidemiol Rep PAHO* 48(42):239, 20 Oct 1976, based on *Morbid Mortal Weekly Rep CDC* 25(36), 1976.