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The National Tuberculosis Program: A Case Study in Program Administration

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Overall, the disease control strategies of the National Tuberculosis Program (NTP) have improved over time. Owing to some organizational and managerial problems, however, the NTP has not been able to effectively implement its control strategies especially before 1986 when program resources were very inadequate. Hence, tuberculosis has remained a major public health problem in the Philippines despite the fact that the organized movement for TB control in the country started way back in 1910. Evidently, improvements in disease control strategies can substantially contribute to problem effectiveness only if the implementing organization could provide adequate work force for the implementation of improved control strategies, and if there are enough program managers who could provide adequate technical assistance and administrative support to program implementors. But program managers can provide adequate technical assistance and administrative support to program implementors only if there are sufficient funds and facilities for the performance of management functions. A program can be provided with adequate resources only if it receives strong political support.

Introduction

Medically, there are no more obstacles to the control of tuberculosis (TB). The series of medical breakthroughs against TB which started about five decades ago has already made tuberculosis one of the most curable and preventable diseases. Drug discoveries have enabled the prevention of the disease through BCG vaccination, have rendered surgery unnecessary in the treatment of the disease, and have even shortened the period of treatment through the use of anti-TB drugs from over a year to only six months.

Despite the medical advances in the treatment of tuberculosis, however, TB has remained a major public health problem in the Philippines. Based on the National TB Prevalence Survey conducted in 1981-1983, it has been estimated that in 1988 at least

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387,560 Filipinos were suffering from infectious tuberculosis (Valeza, *et al.* 1988:1). Each of these infectious TB cases may have transmitted *TB bacilli* to many other Filipinos by now. It has been estimated that each infectious TB case transmits TB bacilli to an average of 10 persons per year (Valeza, *et al.* 1988:1). About 10 percent of the newly infected persons become tuberculous several years after primary infection, and about 50 percent of those who become tuberculous eventually become infectious (Valeza, *et al.* 1988:1).

What is more distressing is that the Philippines has lagged behind in the control of tuberculosis compared with neighboring Asian countries. As of 1986, Japan had a respiratory TB mortality rate of only 3.3 per hundred thousand population; Peninsular Malaysia, only 2.48; Singapore, 6.2, and Thailand, 9.7. Sarawak in 1981 (the latest data available) had only 8.58 (SEAMIC 1988), while the Philippines in 1987 still had 50.0 per hundred thousand population (DOH-HIS 1989b).

Scope and Objectives

This study aims to identify the program administration processes and approaches which have either enhanced or diminished the effectiveness of the National Tuberculosis Program (NTP), primarily to provide empirical bases for deciding what processes and/or approaches are to be emphasized or de-emphasized in order to improve the NTP's effectiveness in the future. To achieve this objective, this study describes how the NTP's disease control strategies, organizational structure and management approaches changed over time; identifies the major factors behind these changes; and assesses how these changes have affected program effectiveness. It also identifies changes that have to be made in the existing disease control measures, organizational structure and management approaches of the NTP in order to improve the effectiveness of the program.

This study focuses on the disease control strategies, organizational structure and management approaches of the NTP during the 1980s. Nonetheless, significant changes that occurred prior to 1980 are briefly reviewed in order to provide a backgrounder for what exists and for changes made in the 1980s.

Conceptual and Analytical Framework

TB control in the Philippines can refer to medical and nonmedical interventions of the government, the nongovernmental organizations and the private sector in controlling the disease. In this study, however, "National Tuberculosis Program" (NTP) simply refers to the tuberculosis control program of the national government which is implemented by the Department of Health (DOH).

The major variables in this study are operationally defined as follows:

(1) *Disease Control Strategies* refer to the specific methods, approaches and technology used by the NTP in preventing, identifying and curing tuberculosis.

(2) *Organizational Structure* refers to the flow of authority and responsibility from the highest hierarchical level to the lowest level of operations, the distribution of personnel and functions at each hierarchical level, and the NTP's working relationship with other public health programs and other agencies.

There are two major organizational arrangements for TB control: the vertical and the integrated arrangement. In the vertical arrangement, the TB control infrastructure and personnel are independent from those of other public health programs, and are directly under the administrative supervision and control of the central office for TB control. In the integrated arrangement, TB control forms part of the general health service structure. Hence, TB control is part of the routine activities of the general health service workers who are under the administrative supervision and control of the health officers, rather than program managers, for the area.

(3) *Management Approaches* refer to the approaches used in the formulation of objectives and targets, the ways and means of ensuring compliance with the standard operational and technical procedures, and the ways and means of responding to the needs and problems of the implementing levels in achieving the program's objectives, targets and standards.

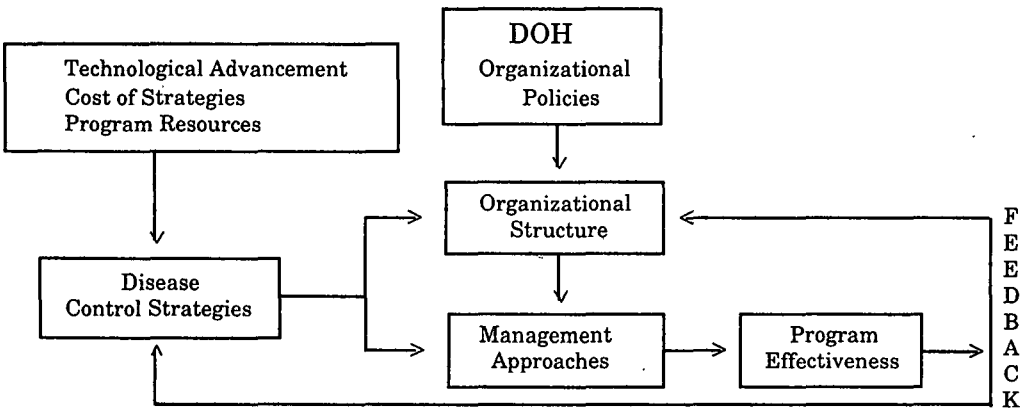
Interrelationships of Variables

The interrelationships of the major variables in this study are shown in Figure 1.

The arrows in the diagram do not represent causal relationships. They simply show that each variable is influenced by some other variables.

As shown in the diagram, the choice of disease control strategies could be influenced by technological advancements such as drug discoveries, the relative cost of available strategies, and the available resources of the program. A change in the control strategies may call for corresponding changes in the organizational structure and in the management approaches of the program. However, the extent of change that can be undertaken in the organizational structure may be determined largely by prevailing DOH policies concerning the health service structure at large. On the other hand, the extent of change that can be done in the program's management approaches may be determined by its organizational structure.

Figure 1. Interrelationships of Variables



Effective implementation of a disease control program largely depends upon how well the program's organizational structure and management approaches respond to the demand of the program's disease control strategies. Thus, improvements in TB control strategies may not enhance program effectiveness unless corresponding modifications in the organizational structure and in the management approaches take place.

Program effectiveness is evaluated at two levels:

(1) program services; and

(2) program outcome.

Indicators for program services include, among others:

(1) number of TB cases identified and treated;

(2) treatment completion and/or dropout rates; and

(3) conversion rate or the rate at which sputum-positive (infectious) patients who underwent treatment had become noninfectious or sputum-negative at or before the end of treatment period.

On the other hand, indicators for program outcome include, among others:

(1) prevalence of infectious cases (number of sputum-positive cases per thousand population;

(2) TB morbidity rate (number of persons afflicted with tuberculosis per hundred thousand population); and

(3) TB mortality rate (number of deaths from TB per hundred thousand population).

Improvements in program services may lead to improvements in program outcome. But this may not be the case if the number of TB cases cured is less than the number of new cases resulting from the transmission of the disease from uncured infectious patients.

Feedback on program effectiveness may lead to further improvements in disease control strategies, organizational structure and management approaches.

Hypotheses

The major hypothesis in this study is that, improvements in the NTP's disease control strategies may not contribute to program effectiveness unless the corresponding organizational and managerial improvements necessary for the effective implementation of improved control strategies take place. This study further hypothesizes that:

(1) the choice of the NTP's disease control strategies could be influenced by technological advancements such as drug discoveries, the relative cost of available disease control measures, and the available resources of the program;

(2) the extent to which the NTP's organizational structure could respond to the demands of improved control strategies may be determined largely by DOH organizational policies; and

(3) the extent to which the NTP's management approaches could respond to the demands of improved control strategies may be determined by the program's organizational structure.

Methodology

The case study method was used in this research focusing on Regions III and VIII. More specifically, documentation and analysis of the NTP's disease control strategies, organizational arrangement and management approaches were based on: (1) review of pertinent secondary data; (2) semistructured interviews with program managers and field health workers; and (3) actual observation of how the program is being carried out in the field.

Historical Background[1]

American Colonial Period: 1902-1934

The organized movement for the control of tuberculosis in the Philippines started on 10 July 1910 with the founding of the Philippine Tuberculosis Society (PTS), a private but government subsidized agency (Valeza, *et al.* 1988:1). Prior to this period, tuberculosis was hardly given any mention at all as the public health sector had to concentrate on the control of epidemics such as cholera, smallpox and plague. Hence, by the time the PTS was established, the country's annual mortality rate was already high at 185.7 per hundred thousand population (Valeza, *et al.* 1988:1).

The PTS attempted to control the disease primarily by providing hospital and clinical services. Hence, it established the Santol Sanitarium in 1918, the country's biggest TB hospital which was later renamed Quezon Institute in recognition of the support and interest given to the TB control program by the late President Manuel L. Quezon who himself was a victim of the disease. It also established free dispensaries in Manila and in some provinces. Twenty years after the founding of the PTS (in November 1930), however, TB mortality rate rose to 235.2 per hundred thousand population compared to only 185.7 per hundred thousand population in 1910 (Valeza, *et al.* 1988:1).

In response to the worsening TB problem, the Philippine Tuberculosis Commission, the first public agency for TB control, was established on 30 November 1930 by virtue of Legislative Act No. 3743. Three years later, Legislative Act No. 4007 was promulgated, abolishing the Philippine Tuberculosis Commission and transferring all its functions and assets to the newly created Tuberculosis Section of the Bureau of Health (now called Department of Health). Like the PTS, the Commission and the Section of Tuberculosis adopted a vertical organizational arrangement for, and an institutional approach to TB control. The government aimed at controlling TB on a large scale, but the Section of Tuberculosis was equipped with only 4 mobile x-ray units and had only 3 chest clinics and 14 personnel for the entire country. Consequently, the only large scale accomplishment of the Section was mass flouroscopic examination. The main method of curing tuberculosis then involved surgery and confinement of patients in TB sanitaria. Hence, having the largest TB sanitaria in the country, the PTS continued playing the greatest role in treating TB patients.

Commonwealth and Japanese Periods: 1935-1945

The Commonwealth government, having a president (Manuel L. Quezon) who himself was a victim of tuberculosis, significantly increased the country's resources for TB control. This paved the way for the construction of modern TB sanitaria and dispensaries, purchase of modern mobile x-ray facilities, and training of additional physicians for TB control. The TB research laboratory at the San Lazaro Hospital was

also started on 1 January 1938. Although treatment facilities were improved, surgery had remained the main method of treating TB patients as the first anti-TB drug (Streptomycin) was discovered only in 1944 (Reyes 1986:19).

Only four years after the establishment of the Commonwealth government, World War II loomed. The Philippines was attacked and occupied by Japanese forces from 1942 to 1945. This resulted in the destruction of virtually all the equipment of the Section of Tuberculosis. Thus, all the TB control activities of the Section was discontinued during the Japanese Occupation. The war ended with the surrender of Japan on 2 September 1945.

Rehabilitation Period to Present: 1946-late 1980s

The Philippines was granted political independence by the United States on 4 July 1946. In the same year, the US Congress passed US Public Health Law No. 370, otherwise known as the Philippine Rehabilitation Act of 1946. This Act granted the Philippines an aid amounting to $600 million on the condition that the Americans be given parity rights. The proviso in the said Act was detrimental to the country's economic situation in the long run, but the Philippine government had no choice but to grant parity rights to the Americans as it was then financially incapable of rehabilitating the country on its own.

As part of the emergency public health program of the Philippines after World War II, the US Public Health Service (USPHS) inaugurated the emergency TB control program in April 1946. By this time, hospitalization was still the main approach to treatment and care of patients. A minimum of about 50,000 hospital beds were needed for TB patients but only about 2,500 were available. Hence, although the Tuberculosis Section of the Department of Health was the official government agency for TB control, it received much smaller financial assistance compared to the PTS as the government's priority then was the rehabilitation of the Quezon Institute.

Mass BCG vaccination was introduced by the USPHS in 1948. However, the limited supply of vaccine hindered BCG vaccination on a mass scale. To augment the country's vaccine supply, the USPHS and the Philippine government jointly financed the establishment of a BCG vaccine laboratory in Alabang the following year (1949).

The Public Health Rehabilitation Program was terminated in the early 1950s following the gradual phase out of USPHS starting 1949. Nonetheless, other international agencies had stepped in to take over the activities of USPHS. Among these were the World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF). Apart from extending financial and technical assistance to the program, these two agencies have played a significant role in the choice of TB control strategies as well as in the formulation of program policies.

As a result of two consecutive DOH reorganizations, the Section of Tuberculosis was placed under the newly created Division of Laboratories in 1947, and later became a Division of Tuberculosis directly under the Office of the Secretary of Health in 1951. During this period, two anti-TB drugs, particularly Streptomycin (discovered in 1944) and Para-aminosalycylic or PAS (discovered in 1946) were already available in the market. Two other anti-TB drugs, Pyrazinamide and Isoniazid, were subsequently discovered in 1951 and 1952, respectively (Reyes 1986:19). Despite these medical breakthroughs against tuberculosis, however, the disease had remained the leading cause of death in the country owing primarily to the meager budget allotted to the program (Valeza, *et al.* 1988:1). Further contributing to the slow control of the disease in the country was the fact that the only available method of treating tuberculosis with anti-TB drugs then was the Standard Regimen which required a long treatment period of 12 to 18 months.

In 1954, the Tuberculosis Law (Republic Act No. 1136) was passed to assure funds, although inadequate, for the control of the disease (Valeza, *et al.* 1988:1). This law also acknowledged supervised home care (ambulatory and domiciliary approach) as an alternative to the expensive institutional (hospitalization) approach. At the same time, the TB Law provided for a highly centralized TB control structure wherein all the TB field units are under the direct supervision and control of the Division of Tuberculosis.

The centralized structure prescribed by the Tuberculosis Law, however, was later superseded by the reorganization plan prepared by the Government Survey and Reorganization Commission (GSRC). By authority of Republic Act No. 997 of 1953, as amended by Republic Act No. 1241 of 1955, GSRC recommended the decentralization and integration of all DOH programs, including TB control. The Division of Tuberculosis was then transferred to the Bureau of Disease Control and its functions were limited to only staff duties. The administrative functions of the Division were delegated to the newly created regional health offices and to the provincial health offices. The line functions of the TB dispensaries and chest clinics, on the other hand, were integrated into the functions of the Rural Health Units (RHUs).

Several years after the implementation of the reorganization plan, some health programs, including malaria control, were recentralized as their overall effectiveness had declined under the integrated structure. TB control was among the DOH programs which were not recentralized primarily because WHO and UNICEF favored the decentralization and integration of the program. The strong bias of these two international organizations for decentralization and integration of TB control stemmed from the need to expand the program's coverage to the rural areas.

Delays in the organization of regional health offices brought about by difficulties in operationalizing decentralization and integration of health services disrupted the continuity of TB control program implementation during the late 1950s and the early

1960s. This factor, coupled with the need to pilot-test new diagnostic and treatment methods such as sputum microscopy and supervised home care (ambulatory and domiciliary approach), led to the decision to gradually integrate TB control activities into the functions of the RHUs. Hence, the nationwide integration of TB control into the general health service structure started only in 1968. Until 1970, however, the program was still aiming at a smooth integration of its casefinding and treatment activities by having at least one demonstration province in each health region.

Since September 1976, BCG vaccination of children 0-8 years old became mandatory by virtue of Presidential Decree No. 996. The said decree also transferred the BCG functions of the NTP to the newly created Expanded Program on Immunization (EPI). Nonetheless, BCG vaccination has continued to be implemented by the same RHU staff implementing the NTP as the EPI has also been integrated into the general health service structure.

Another significant development occurred in 1977. During this year, the Ministry of Health and the PTS jointly established the National Institute of Tuberculosis (NIT) with the assistance of WHO and UNICEF. Until 1986, the NIT served as the training and research arm of the NTP. One of its greatest contribution to the program was the conduct of the 1981-1983 National TB Prevalence Survey through which it was found that TB prevalence rate in the country had increased to a high of about 6.6 sputum-positive cases per thousand population compared to only 4 per thousand in 1964. This prompted DOH to mobilize BHWs for TB casefinding and treatment and to pilot-test the use of Short Course Chemotherapy starting 1985.

The integrated structure for the NTP at the lower levels was strengthened in 1984. By virtue of Executive Order No. 851, DOH (then called Ministry of Health) was reorganized with the end in view of integrating the curative and the preventive aspects of health care in accordance with the concept of Primary Health Care. The RHUs were placed under the direct supervision and control of the District Health Office, thereby making it easier for the RHU staff to refer TB cases that they cannot handle to the district hospital. At the same time, however, Executive Order No. 851 significantly weakened the NTP structure at the central level by reducing the Division of Tuberculosis into a mere Section of Tuberculosis with only four medical staff and a clerk to perform the staff functions for the nationwide implementation of the NTP.

The latest structural change in the NTP occurred in 1986 when DOH was again reorganized by virtue of Executive Order No. 119. This time, the NTP structure at the central level was significantly strengthened by elevating the status of the Section of Tuberculosis into a TB Control Service under the Office for Public Health Services with a personnel complement of 38, while the former structural arrangements at the lower levels were maintained. In the same year, the NTP launched its Short Course Chemotherapy which requires a much shorter treatment period compared to the

Standard Regimen. And, for the first time in the history of TB control in the Philippines, the program has been given adequate budget for drugs and laboratory supplies starting in 1987.

Disease Control Strategies

In a country where tuberculosis is a major public health problem, effective control of the disease necessitates simultaneous and large-scale application of all the basic tools for TB control, i.e., BCG vaccination, casefinding and chemotherapy.

Tuberculosis was already the leading cause of death among the Filipinos when the organized movement for TB control in the country started in 1910. Until 1947, however, only two of the basic tools, particularly casefinding and chemotherapy, had been used in controlling tuberculosis in the country. This was so because BCG vaccination had never been heard of in the Philippines until 1947.

BCG vaccination was introduced in the Philippines by the USPHS in 1948. Owing to limited supply of vaccines, however, this was not implemented on a mass scale until after the establishment of a BCG vaccine laboratory in Alabang in 1949 (Tiglao and Cruz 1975:164-165). Hence, the program started administering BCG vaccination on a mass scale only in 1952.

In view of the limited resources for TB control, WHO advised the government to give more emphasis to BCG vaccination than casefinding and chemotherapy primarily because BCG vaccination is much cheaper and easier to administer on a large scale compared to the two other tools for TB control (Tiglao and Cruz 1975:165). WHO's policy to emphasize BCG vaccination more than casefinding and chemotherapy may have been influenced also by UNICEF which is primarily concerned with the plight of children who compose the beneficiaries of BCG vaccination.

Since the program was then unaware of the limitations of BCG vaccination, it heeded the advice of WHO and hence, had been giving more emphasis to BCG vaccination than casefinding and chemotherapy from 1952 to 1985.

The adoption of mass BCG vaccination in addition to casefinding and chemotherapy as basic tools for controlling tuberculosis was a significant improvement of the NTP's disease control strategy. This contributed to the reduction of the country's TB mortality rate from 135.5 per hundred thousand population in 1950 (DOH-TCS 1988b:1) to only 50.0 per hundred thousand population in 1987 (DOH-HIS 1989). Likewise, the shift in the program's emphasis from the curative to the preventive aspect of TB control widened the program's coverage in protecting children from fatal forms of tuberculosis. Unfortunately, however, this also led to less effective implementation of the more important tools for TB control, i.e., casefinding and chemotherapy, because the adoption of mass BCG vaccination as the main TB control

measure had resulted in the allocation of very meager funds for the identification and treatment of TB patients until 1985. BCG vaccination protects children from fatal forms of tuberculosis but it neither prevents TB infection nor reduces transmission of the disease to healthy individuals. Consequently, since the importance of casefinding and chemotherapy had been underestimated, the sources of TB infection (sputum-positive cases) had continuously increased from only 4 per thousand population in 1964 to 6.6 per thousand population in 1983.

The change of political leadership in 1986 paved the way for the allotment of ample funds for anti-TB drugs and laboratory supplies amounting to P150 million per year starting in 1987. This, coupled with the continued assistance for mass BCG vaccination from UNICEF, has enabled the program to simultaneously apply all the basic tools for TB control on a large scale basis. However, the most powerful weapons for controlling tuberculosis, i.e., casefinding and chemotherapy, are still wanting in the organizational and management aspects.

Casefinding Methods and Approaches

There are three methods of identifying TB cases: (1) sputum microscopy; (2) chest x-ray; and (3) sputum smear culture. These methods differ in terms of cost, limitations as well as effectiveness in identifying the priority group for treatment, i.e., the sputum-positive or infectious cases which compose the sources of TB infection (see Table 1).

Table 1. Comparative Characteristics of TB Casefinding Methods

Casefinding Method	*Cost*	*TB Cases Detected*	*Limitations*	*Basic Facilities Needed*	*Type of Personnel / Training Required*
Sputum Microscopy	Cheapest	Severe or sputum positive only	Can't detect non-infectious cases	Microscopes, glass slides, reagents and sputum cups; with or w/o electricity	Preferably Med. Tech. but any health worker trained in sputum microscopy can do the job.
Sputum Smear Culture	Most expensive	Sputum-positive or severe and less severe or culture-positive	Capability to distinguish between severe and less severe cases is not yet established; Can't detect early state of PTB	Incubator, refrigerator, inspissator, glass slides, reagents and sputum cups; with electricity.*	Medical Technologists with intensive training in sputum smear culture.*
Chest X-Ray	Less Expensive	Severe, less severe and early stages of PTB.	Can't distinguish between infectious and noninfectious cases.	X-ray machines x-ray films, and electricity	Radiologists and X-ray technicians.

* Based on the interview with Dr. Nora Cruz of the TB Control Service (TCS), April 1990.

Sputum microscopy is the cheapest and the most reliable method of detecting the infectious TB cases. Unfortunately, however, this method had not been heard of in the Philippines until its introduction by WHO and UNICEF in 1964. Sputum microscopy was officially adopted as the main casefinding method only in 1968, following the pilot-testing of this approach in several provinces. Hence, the only casefinding method used by the program prior to 1968 was chest x-ray.

Chest x-ray is cheaper than sputum smear culture, but it is more expensive than sputum microscopy and cannot be performed in the absence of electricity. Hence, casefinding prior to 1968 had been done mostly in the urban areas where electricity and chest centers were available. Likewise, since this does not allow distinction between the infectious and the noninfectious TB cases, the program could not segregate the sputum-positive patients who were supposed to be given priority in treatment.

The adoption of sputum microscopy since 1968 has enabled the program to increase its casefinding coverage. Since this method can be performed even in the absence of electricity, it has allowed mass casefinding even in the rural areas. Its limitation, however, is that it can only detect the sputum-positive cases. It is not an effective approach in detecting the less severe and the early stages of PTB which may soon deteriorate into the infectious stage if not immediately identified and treated. Hence, to be able to identify the noninfectious TB cases, the program decided to adopt chest x-ray as its secondary method of casefinding.

Chest x-ray, however, has remained more popular than sputum microscopy among the TB symptomatics as shown by their preference to be diagnosed through the former than through the latter. One reason for this is that the private sector, which has gained the reputation of having modern facilities and better quality of services compared to the public health sector, has continued adopting chest x-ray as its main casefinding method. Likewise, the processes involved in sputum microscopy has been considered unhygienic (*nakakadiri* was the term used) by field health workers. Hence, as much as possible, field health workers avoid functions related to sputum microscopy for fear that they might inhale the *tubercle bacilli* excreted by infectious TB patients. This negative attitude of field health workers toward sputum collection and preparation of sputum smears may have made some TB symptomatics believe that sputum microscopy is a crude way of diagnosing TB patients. This also explains why casefinding coverage of the program remained low especially before 1985 (see Table 2).

In 1985, the number of sputum examined significantly increased to more than a million compared to only 269,887 in 1984. This can be attributed to several factors. For one, the integration of hospital and public health services in 1984 increased the facilities for TB casefinding and enabled the district hospital and the RHU staff to join hands in the implementation of the NTP. The National Consultative Workshop which was held in 1984 to discuss the results of the 1981-1983 National TB Prevalence

Survey also prompted the workshop participants (Provincial Health Officers and Chiefs of District Hospitals) to demand a substantial increase in the casefinding output of RHUs and BHSs. More importantly, in line with the concept of Primary Health Care, DOH started training and mobilizing voluntary health workers called the Barangay Health Workers (BHWs) for sputum collection in 1985. Such training included the actual collection of sputum by the participants.

Table 2. Casefinding Accomplishments of the NTP: 1980-1988

Year	*Total Sputum Examined*	*Sputum Positive Identified*	*% of Estimated* Infectious Cases*
1980	199,035	17,275	5.4
1981	229,184	19,006	5.8
1982	242,150	20,676	5.8
1983	261,636	18,657	5.4
1984	269.87	21,291	6.0
1985	1,094,752	39,571	11.0
1986		No data available	
1987	1,015,423	72,150	19.1
1988	1,090,882	63,555	16.4

*Number of infectious cases was estimated using a constant TB prevalence rate of 6.6 per thousand population.

Sources: Annual Plans and Annual Accomplishment Reports of the National Tuberculosis Program.

To further increase its casefinding coverage, the NTP shifted its casefinding approach from "passive" to "active" in 1986. In contrast to the "passive" approach wherein the field health workers only wait for TB symptomatics to come to the health center for examination, the "active" approach involves a house-to-house identification of and collection of sputum from TB symptomatics. The latter approach is better than the former as this significantly increases the program's casefinding coverage. However, casefinding can be truly active only if there are enough field health workers for the house-to-house identification of, and collection of sputum from, TB symptomatics. Unfortunately, lack of public health personnel has been a perennial problem in the country especially at the implementing levels where each field health worker is concerned not only with TB control but with practically all public health programs. Nonetheless, the program somewhat augmented its work force by mobilizing BHWs

for sputum collection since 1985. This, coupled with the allotment of ample funds for laboratory supplies, has contributed to the substantial increase in the number of identified sputum positive cases after 1986.

Treatment Methods and Approaches

The sputum-positive cases, being the sources of TB infection, compose the priority group not only in casefinding but in treatment as well. Prior to 1968, however, the lone casefinding method (chest x-ray) used in the Philippines did not allow distinction between the sputum-positive and the sputum-negative TB cases. Hence, the priority group then was composed of the lung cavitary cases, some of whom may not be infectious if examined through sputum-microscopy.

The adoption of sputum microscopy for detecting sputum-positive cases and chest x-ray for identifying noninfectious cases since 1968 has enabled the program to prioritize the allocation of treatment resources in the following order:

(1) sputum-positive cases;

(2) noninfectious cavitary cases or sputum-negative cases with lung cavitary lesion on x-ray examination; and

(3) sputum-negative, noncavitary cases (NTP 1980:14).

But the main problem of the program until 1986 was that there was virtually no treatment resources to prioritize. In 1984, for instance, the program was able to start treatment for only about 36 percent of the identified TB cases and was able to achieve a treatment completion rate of only about 17 percent among those who started treatment primarily because the budget for anti-TB drugs was inadequate (MOH 1986c:5).

Apart from the inadequacy of the budget for anti-TB drugs, the treatment method used by the program also contributed to the low treatment completion rate prior to 1986. Until mid-1986, the program had been using only the conventional method of chemotherapy which is otherwise known as the Standard Regimen (SR). This method requires a treatment period of 12 to 18 months, and is composed of Isoniazid (INH) tablets and Streptomycin (SM) intramuscular injections. The INH tablets could be self-administered by the patients at home. However, the SM intramuscular injections have to be administered by the health personnel at the health center daily for the first month of treatment and twice a week thereafter. Hence, the Standard Regimen requires TB patients to come to the health center for SM injections at least twice a week for a period of 12 to 18 months. This, indeed, is a tall order for patients residing in the remote areas where travel is very difficult, much more so for

those who cannot afford the cost of travel. In addition, the long period of treatment and the muscular pains resulting from SM injections discourage patients from completing the treatment.

Prior to the 1980s, the Short Course Chemotherapy (SCC), an alternative regimen which requires a treatment period of only 6 to 8 months, had already been widely used in developed countries. In fact, the main drug component in the SCC, i.e., Rifampicin, was discovered as early as 1964 (Reyes 1986:19). Owing primarily to its greater cost, however, it was only in 1985 that the SCC was pilot-tested in the Philippines. The decision to pilot-test SCC in the country was primarily triggered by the results of the 1981-1983 National TB Prevalence Survey which revealed, among others, that the country's infectious TB prevalence rate had grown to a high of 6.6 sputum-positive cases per thousand population compared to only 4 per thousand in 1964. The NTP launched the adoption of SCC on 19 August 1986. The adoption of the Short Course Chemotherapy could be considered a great leap in the history of the NTP as far as choice of control strategy is concerned. So far, it is only in this case that the choice of control strategy gives more weight to medical effectiveness than cost.

As of November 1988, the total cost of the six-month treatment per patient under the SCC was ₱821.84 while that of the 12-month treatment under the Standard Regimen was only ₱629.75 (see Table 3). However, the slightly higher cost of SCC compared to SR is offset by its greater effectiveness in curing tuberculosis. The partial report (from 6 regions) on the SCC Retrospective Cohort Analysis shows an average treatment completion rate of about 85.4 percent per region in 1988. This was more than double the 41.29 percent treatment completion rate under the Standard Regimen in 1985 (the latest data available). The same report also shows that about 74 percent of the sputum-positive patients who completed treatment under the SCC had become noninfectious at or before the end of the six-month treatment period. The corresponding data on conversion rate under the Standard Regimen are not available. Nonetheless, the fact that SR requires a much longer period of treatment compared to SCC implies that SR is much slower in converting sputum-positive cases into the noninfectious stage.

The cost of SCC drugs, however, has influenced the NTP's policy on the use of these drugs. Since these are more expensive than SR drugs, the program limits the use of SCC drugs only to newly discovered positive cases, lung cavitary cases, and treatment failures of the Standard Regimen (DOH-TCS and NIT 1988).

The program's policy on the limited use of SCC drugs has created resentment on the part of some sputum-negative, noncavitary patients who have been excluded from the Short Course Chemotherapy. Their resentment stems from the fact that treatment under the Standard Regimen is much more agonizing compared to that of the SCC. Thus, it is likely that some noninfectious, noncavitary patients would refuse to be treated until such time that they become infectious so that they, too, could qualify for the Short Course Chemotherapy.

Nonetheless, the NTP has started to address the problems posed by the use of the Standard Regimen by undertaking a study on the feasibility of substituting the Standard Regimen with the Intermittent Short Course Regimen (ISCR). The ISCR requires the same treatment period (6 to 8 months) and uses the same combination of drugs (INH, Pyrazinamide and Rifampicin) as those of the SCC, but its Rifampicin component is administered less frequently (twice a week) than that of the SCC (daily). As shown in Table 3, the cost of ISCR is much lower than that of SR. Hence, if proven feasible under Philippine conditions, the use of ISCR as an alternative to SR will increase treatment completion and conversion rates and will enable the program to generate savings from its budget for drugs.

Table 3. Comparative Characteristics of Treatment Methods

Treatment Method In 1988	*Cost Per Patient*	*Beneficiaries*	*Treatment Period*	*Forms of Drugs Used*	*Effects on Program Effectiveness*
SCC	₱821.84	Sputum-positive and noninfectious, cavitary patients	6 - 8 months	Tablets and Capsules	Higher treatment completion rate; Faster conversion rate; More adverse reactions.
SR	₱629.75	Sputum-negative, noncavitary patients	12 - 18 months	Tablets and intramuscular injections	Lower treatment completion rate; Slower conversion rate; Less adverse reactions.
ISCR	₱292.00	Sputum-negative, noncavitary patients	6 - 8 months	Tablets and capsules	Under study

Service Delivery Approaches

In 1962, WHO and UNICEF introduced the concept of free home treatment through distribution of free INH tablets to TB patients. This was done in line with the proposal to adopt the ambulatory and domiciliary approach to treatment and care of TB patients. The official shift from the institutional to the ambulatory and domiciliary approach, however, started in 1968, simultaneous with the integration of TB control into the general health service.

In contrast to the institutional approach which calls for the confinement of TB patients in hospitals, the ambulatory and domiciliary approach calls for the treatment of patients on outpatient basis and self-administration of anti-TB drugs by the patient at home. The latter is apparently more economical than the former on the part of both the program and its clients. However, the ambulatory and domiciliary approach can be an effective control strategy only if field health personnel could frequently visit each patient to ensure that the patient is religiously taking the medicines, to remind the patient to regularly visit the health center for replenishment of the drug supply and/or for SM injections, and to remind the patient and family members of the necessary precautions that they should take in order to avoid transmission of the disease.

Unfortunately, there were not enough health personnel to implement the ambulatory and domiciliary approach especially before the mobilization of BHWs for casefinding and chemotherapy in 1985. This factor coupled with the lack of anti-TB drugs for free distribution to TB patients contributed to high dropout rate, poor drug-taking compliance and speedy transmission of the disease prior to 1986.

Overall, the NTP's disease control strategies have improved over time. Owing to some organizational and managerial problems, however, the NTP has not been able to effectively implement its control strategies especially before 1986. And this partly explains why tuberculosis has remained a major public health problem in the Philippines despite the fact that the organized movement for TB control in the country started way back in 1910.

Organizational Structure

From the creation of the first public agency for TB control in 1930 until 1967, the NTP had a vertical organizational structure. The program was implemented by health personnel of public TB dispensaries and chest centers under the direct supervision and control of the program personnel at the central level. Owing to shortage of TB personnel and facilities vis-a-vis the magnitude of TB problem, the program then hardly reached TB patients in the rural areas.

With the end in view of extending TB control services to the rural areas, the NTP has been integrated into the general health service structure since 1968. This change in the NTP's organizational structure has enabled the program to substantially expand its area coverage. This has also made the program more accessible to TB patients in the rural areas especially after the creation of BHSs in 1975. However, this has also given rise to problems on capability of program implementors. Unlike the TB personnel under the vertical structure who were specially trained for and worked only for TB control, the RHU and BHS staff could only devote part-time services to the program as they are concerned with many other public health programs. The multi-

farious role of the staff has been aggravated by the inadequate and untrained personnel complement of the RHU and the BHS, plus the fact that these health centers lack the necessary facilities for the simultaneous implementation of all the integrated public health programs. These factors partly explain why the program has not been able to strictly implement its labor-intensive control strategies such as the "active" casefinding approach and the ambulatory and domiciliary approach to treatment and care of patients.

In 1984, DOH was reorganized with the end in view of integrating the hospital and public health services in accordance with the concept of Primary Health Care. This reorganization prompted the RHU and the district hospital to coordinate with and help each other in the implementation of the NTP. The District Health Office was created and has been tasked to supervise the RHU and the district hospital. This setup has thus made the RHUs closer to decisionmakers compared to the situation prior to 1984 where problems encountered by the RHUs had to be referred to the provincial level. Yet, owing primarily to the absence of full-time TB coordinators at the district level and the inability of the higher levels to provide adequate support to the newly created District Health Offices, there were instances where the District Health Office served as a bottleneck rather than a facilitator in the implementation of the NTP. Likewise, although the 1984 reorganization of DOH generally strengthened the NTP structure at the implementing levels, the central level structure was weakened by reducing the Division of Tuberculosis into a mere Section of Tuberculosis under the newly created Division of Disease Control. The Section was provided with only four medical staff and a clerk, and was never given a budget for travel. This, as elaborated in the next subsection, drastically affected the supervision and monitoring of program implementation.

The change of political leadership in 1986 led to the reorganization of DOH in the same year. This reorganization has significantly strengthened the NTP structure at the central level by elevating the Section of Tuberculosis to a TB Control Service (TCS) with the rank of a bureau under the Office for Public Health Services. Compared to the former Section of Tuberculosis, the TCS has a bigger staff size (38 as of 1989) and is entitled to a much bigger budget. This has greatly improved the supervision and monitoring of program implementation.

Unfortunately, however, the 1986 reorganization did not solve the problem of inadequate program personnel at the lower levels. Lack, if not absence, of TB coordinators has remained a major problem from the regional to the district level. Furthermore, the personnel complement of the RHU and the BHS has continued to be inadequate for the simultaneous implementation of all the integrated public health programs.

Several factors have been found to have precluded the provision of adequate TB coordinators and program implementors. Among these factors are the following:

(1) the inadequate remuneration for rural health workers which has encouraged them to seek greener pastures abroad or in the urban areas;

(2) the inability of DOH field units to replace those who have resigned or to augment their personnel complement due to lack of funds and/or due to the government's policy to reduce the size of the bureaucracy; and

(3) the low priority given by some general health officers to TB control in providing the work force for the different public health programs.

The lack of support from the private sector and the NGOs has also contributed an organizational problem in the implementation of the NTP. The PTS has been a great help to the program since the establishment of the National Institute of Tuberculosis in 1977 and since the PTS field health units started actively participating in the program in 1978. However, there is still very little support and cooperation from the non-PTS private physicians and the NGOs. The lack of support and cooperation from private physicians could be attributed primarily to the private sector's need to maintain *status quo* in order to prevent reduction of its income source. In their desire to retain private paying clients, private doctors may not be too keen to make referrals to the public health sector. On the other hand, the lack of support and cooperation from the NGOs could be attributed primarily to the government's suspicion of, and difficulty in relating with, Community-Based Health Programs (CBHPs). CBHP's are noted for their application of class analysis and concern for organizing underserved communities.

Management Approaches

Prior to the integration of TB control into the general health service in 1968, program managers had been exercising both administrative and technical supervision over the program implementors. The shift in the NTP's organizational structure from vertical to integrated since 1968 has limited the supervisory powers of program managers to only the technical aspect since the general health workers tasked to implement the program are under the administrative supervision and control of the general health officers. Nonetheless, the expanded program coverage brought about by the integrated arrangement, plus the fact that general health workers lack the knowledge and experience in TB control, have required a much greater effort on the part of the program managers in ensuring that the program is carried out effectively and in accordance with the standard technical and operational procedures.

Various management approaches have been used in enabling and motivating the implementing levels to carry out the program effectively and in accordance with the standard procedures. Among these are the following:

(1) updating and distribution of NTP Manual and other written guidelines;

(2) continuous training of program workers;

(3) conduct of supervisory visits to the implementing levels;

(4) prompt communication of management concerns to the field health units;

(5) holding of catchment area conferences;

(6) imposition of monthly quota for casefinding;

(7) program monitoring through periodic reports; and

(8) managerial innovations that minimize delays in casefinding and treatment.

Distribution of updated NTP Manuals and other written guidelines helps the program workers in understanding the various control strategies as well as standards of the NTP. This, however, does not automatically ensure compliance with the standard operational and technical procedures. Some health personnel may not be able to find time or fully comprehend what is written in the manuals and guidelines, not to mention the negative attitude of some health workers toward TB control which reduces the probability that health workers will really strive to comprehend the manuals and guidelines.

The impact of training on the effectiveness of the program largely depends on the ability of program managers to identify the kind of training that is needed most given the situation obtaining in the field.

Training of program workers results not only in better compliance with standard procedures but in increased program services as well. Unfortunately, however, inadequate training of program managers and implementors has remained a major problem. This has been attributed to the rapid turnover of public health personnel which is often a consequence of the much lower remuneration for health personnel in the country compared to what is offered to them in developed countries.

Apart from ensuring prompt detection and correction of deviations from standard procedures, frequent supervisory visit by program managers to the implementing levels increases the morale of program implementors as this makes the implementors feel that the higher levels care for them. Evidently, more frequent supervisory visit to the implementing levels leads to greater program effectiveness.

Especially because of lack of transport, two-way communication facilities such as single side band (SSB) radios and telephones are essential in promptly communi-

cating urgent management concerns to the field health units. Unfortunately, some field health units are not provided or have no access to these communication facilities. Although some field health units which do not have two-way communication facilities have managed to promptly communicate urgent management concerns through one-way communication facilities, there is still the risk that urgent messages might not promptly reach their intended destination.

The phrase "catchment area conference" refers to the monthly conference held at the district level primarily to assess the performance of the district and the RHUs in all public health programs and to enable the provincial health officials to identify the needs and problems of the implementing levels. This monthly conference could be a very effective venue for motivating the implementing levels to continuously and substantially improve their performance not only in TB control but in all public health programs. But its effectiveness depends largely upon how it is conducted and how well the higher levels respond to the problems presented by the lower levels.

Imposition of quota for periodic outputs may compel the general health workers to intensify their TB control activities. But quotas that are beyond the capability of program workers to achieve may result in deterioration of the quality of outputs especially if there are not enough TB Coordinators to closely monitor how the program is being implemented.

The NTP periodic reports required of the implementing levels have enabled the program managers to monitor and assess the implementation of the program even if they cannot conduct frequent supervisory visits to the lower levels. But the bulk of paperwork that the implementing levels have to accomplish consumes much of the implementors' time and effort which could have been devoted to actual delivery of program services, especially if basic office supplies like mimeographed NTP monitoring forms are not even available.

Delays in the release of results of sputum examinations and in the initiation of treatment have continually caused the loss of interest on the part of some TB symptomatics to avail of NTP services. These delays can be attributed primarily to lack of microscopists and microscopes, delayed distribution of drugs to the implementing levels, and the NTP's policy to start treatment under the SCC only after the provision of case index numbers by the Provincial TB Coordinator.

The policy to start treatment under SCC only after the provision of case index numbers by the Provincial TB Coordinator is a clear example of a managerial control that diminishes program effectiveness. The need to prevent misuse of expensive SCC drugs on the one hand and the need to speedily reduce the sources of TB infection on the other call for a balance between administrative control and service orientation. Given the difficulty of identifying sputum-positive cases, it is not worthy to adopt a

management control system that causes loss of interest on the part of the already identified infectious patients to undergo treatment.

The 1984 reorganization of DOH could have led to better management of the program if the newly created District Health Offices (DHOs) were provided with adequate work force and facilities. Unfortunately, DOH failed to consider that integration of the curative and the preventive aspects of health care is a demanding task which requires not merely the breaking of the walls between these two aspects but, more importantly, greater resources for, and more attention to, the district level. Consequently, since the DHO has remained extremely undermanned and has not been provided with adequate facilities needed for the supervision and monitoring of the NTP, there were instances where the DHO served as a bottleneck rather than a facilitator. This has been aggravated by the inability of the higher levels to provide the support needed by the DHO.

The 1984 DOH reorganization also weakened the NTP structure at the central level by reducing the Division of Tuberculosis into a mere Section of Tuberculosis under the newly created Division of Disease Control. Since the Section was provided with only five personnel and was never given a budget for travel, the program staff at the central level never had the chance to conduct supervisory visit to the field health units. Consequently, they were not able to promptly detect and correct deviations from the standard operational and technical procedures.

The NTP's management style significantly improved after the 1986 reorganization of DOH. This is partly because the 1986 reorganization strengthened the NTP structure at the central level by elevating the Section of Tuberculosis to a TB Control Service (TCS) which has the rank of a bureau and which is entitled to a much bigger staff size (38 as of 1989) and to a much bigger budget that includes, among others, an item for travel expenses. This organizational change has enabled the TCS staff to visit not only the 13 regions but even some provinces, cities and municipalities at least once a year. In turn, the supervisory visits of the TCS staff to the field health units has motivated the Regional and Provincial TB Coordinators to visit the implementing levels more frequently than before 1986. Field interviews and observations however reveal that the higher levels could have conducted more supervisory visits to more areas if they were given adequate travel allowances and transportation facilities, and if the TB teams from the regional to the district levels were provided with adequate personnel complement.

Apart from the changes in the organizational structure, several other factors have also contributed to the improvement of management approaches during the second half of 1980s. For instance, provision of more drugs and laboratory supplies has been made possible by the substantial increase in the NTP's budget for these items since 1987. The provision of training funds since 1986 has paved the way for the conduct of decentralized and hence, more responsive training programs. And

most, if not all, of the managerial improvements that took place during the second half of the 1980s were primarily triggered by the results of the 1981-1983 National TB Prevalence Survey.

Conclusions

The hypothesis that the choice of TB control strategies is influenced by technological advancements, the relative cost of available strategies and availability of program resources is only partially confirmed, as other factors were found to be equally influential. Factors influencing changes in the NTP's control strategies have been found to include the following:

(1) technological advancements or discovery of anti-TB drugs, vaccines and improved methods of casefinding and chemotherapy;

(2) the relative cost, effectiveness and ease of application of available control strategies;

(3) the availability of resources for new control strategies;

(4) the policies of international agencies upon which the program largely depends for technical and material assistance; and

(5) feedback on program effectiveness.

Several, if not all, of these factors may simultaneously influence the choice of a particular control strategy. But one factor may have greater influence compared to others.

The policies of WHO and UNICEF seem to be the greatest factors that influenced the choice of control strategies prior to 1985. In most cases, these international agencies considered technological advancements, the relative cost, effectiveness and ease of application of disease control measures, as well as the availability of program resources when recommending changes in the NTP's control strategies. In their desire to expand the NTP's coverage, however, these two international agencies may have discouraged the adoption of disease control strategies which may be more expensive in the short run but more cost-effective in containing the sources of TB infection in the long run.

Changes in disease control strategies that occurred in 1985 and 1986 were primarily triggered by feedback on program effectiveness, particularly the results of the 1981-1983 National TB Prevalence Survey. Nevertheless, the relative effectiveness of disease control strategies as well as technological advancements were also

considered in the choice of control strategies in 1985 and 1986. More importantly, the adoption of the most effective method of treating infectious TB cases (Short Course Chemotherapy) since mid-1986, and the greater emphasis given to the most powerful weapons to attack tuberculosis (i.e., casefinding and chemotherapy) since 1987, have been made possible by the provision of greater budgetary allocations for the NTP.

It has been found that DOH organizational policies are just among the several factors that determine or influence changes in the NTP's organizational structure. Although the integration of the program into the general health service in 1968 was in accordance with the 1958 DOH reorganization plan, the decision to pursue this change amidst the difficulties encountered in operationalizing decentralization and integration of health services was primarily influenced by WHO and UNICEF. Likewise, although the major changes in the NTP's organizational structure in the 1980s were direct results of DOH reorganizations, other factors also influenced the changes effected by these reorganizations in the NTP's organizational structure. For instance, the integration of hospital and public health services which has prompted the district hospital and the RHU to coordinate with and help each other in the implementation of the NTP was in keeping with the country's commitment to adopt Primary Health Care. Some respondents for this study have also attributed the diminution of the NTP structure at the central level in 1984 to the relatively low priority given by DOH to TB control compared to other public health programs. On the other hand, the expansion of the NTP structure at the central level in 1986 was primarily triggered by the current data on the status of TB as a public health problem, particularly the results of the 1981-1983 National TB Prevalence Survey. This change in the NTP structure, however, was a direct result of the reorganization of DOH in 1986, which was brought about by the change of political leadership in the same year.

The extent to which management approaches could respond to the demands of disease control strategies is largely determined not only by the organizational structure but also by the availability of funds and facilities for the performance of management functions. Although the elevation of the Section of Tuberculosis to a TB Control Service has resulted in closer technical supervision and monitoring of the program, some of the managerial improvements that occurred in the second half of the 1980s cannot be attributed solely to improvements in the organizational structure. For instance, the provision of more drugs and laboratory supplies to the implementing levels has been primarily a result of the substantial increase in the NTP's budget for these items since 1987. The conduct of decentralized and hence, more responsive training programs has also been a result of the provision of training funds since 1986. And most, if not all, of the managerial improvements that took place during the second half of the 1980s were primarily triggered by the positive response of the new political leaders and health administrators to the results of the 1981-1983 National TB Prevalence Survey.

In conclusion, disease control strategies have an indirect impact on program effectiveness. Their contribution to program effectiveness is mediated by the organizational structure and the management approaches.

Improvements in disease control strategies can substantially contribute to program effectiveness only if the implementing organization could provide adequate work force for the implementation of improved control strategies, and if there are enough program managers who could provide adequate technical assistance and administrative support to program implementors. But program managers can provide adequate technical assistance and administrative support to program implementors only if there are sufficient funds and facilities for the performance of management functions.

Feedback on program effectiveness leads to further improvements in disease control strategies, organizational structure and management approaches. Nonetheless, the international agencies upon which the program largely depends for technical and material assistance also influence changes in disease control strategies and organizational structure, especially in the absence of more reliable data base which can be used as basis for a more autonomous choice of control strategies and organizational arrangements. However, substantial improvements in disease control strategies, organizational structure and management approaches can be effected only if the program is provided with adequate resources. And the program can be provided with adequate resources only if it receives strong political support.

Endnotes

[1]Most of the discussions in this section were based on the book of Teodora V. Tig'ao and Wilfredo L. Cruz (1975) entitled "Seven Decades of Public Health in the Philippines (1898-1972)." To avoid repetitive citation of this reference, however, Tiglao and Cruz will no longer be cited in the footnote for this section. Hence, only references other than the abovementioned authors are footnoted in this chapter.

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