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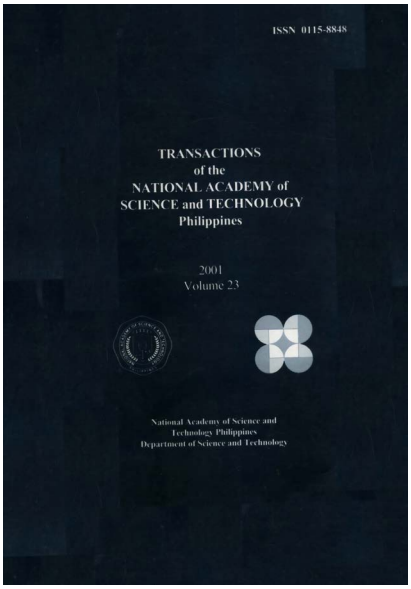

Progress in the Control of Tuberculosis: How Much Has Been Attained in the Philippines Today?

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HEALTH SCIENCES DIVISION

PROGRESS IN THE CONTROL OF TUBERCULOSIS: HOW MUCH HAS BEEN ATTAINED IN THE PHILIPPINES TODAY?

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ABSTRACT

Tuberculosis from time immemorial has disproportionately caused misery to the poor. Malnutrition, environmental factors such as crowding and poor living conditions, unemployment and lack of access to health care are social factors, which are responsible for making tuberculosis the outcome of social misery. In the Philippines, death due to tuberculosis occurs in 75 persons per day and exerts a significant adverse socioeconomic impact as it affects young adults which make up the work force of the population. It remains to be the most significant problem in the Philippines at the close of the century.

However, majority of patients with symptoms of TB either do nothing or self medicate and only a quarter seek medical help. Among those that consult, only 30% go to the public health clinics and 46% consult private practitioners, 17% seek help in the hospitals, while 7% go to traditional healers. Previous studies in India have shown that far from providing superior health care, private practitioners may in fact hinder the progress of the control program as they do not adhere to the standard regimen nor do they have subsidized medications to provide and no system of supervision and monitoring response. To ensure a more effective implementation of DOTS in the country, the private health sector, which is utililized more frequently than the public health sector, should therefore be harnessed into the TB control program. Private practitioners could assist in case finding by referring their patients to the appropriate public health center where subsidized medications under the DOTS strategy could be provided. Alternatively, they could themselves actively participate in the DOTS program of government providing a wider scope of the drug distribution system presently available.

There are a number of models in the Philippines of this private-public collaboration in the TB control. The Makati Medical Center (MMC) DOTS clinic is just one of them. Established in February 1999, it has enrolled approximately 400 patients by this time with 86.3% treatment success for new cases and 35.4% for retreatment cases. The dismal result in the latter is due to multi-drug resistant

TB (MDR-TB) among retreatment cases as a consequense of he inadequate previous treatment received by these patients. The control of MDR-TB is a far more complicated and expensive undertaking and its generation by inadequate TB treatment underscores the urgent need for a more rigorous implementation of DOTS as it is most effective measure ti prevent the emergence of MDR-TB.

The Philippine Coalition Against Tuberculosis is embarking on developing programs whereby private physicians can be enlisted in the national TB Control Program through a system of accreditation following a training program on DOTS. This strategy would provide the patients viable choices of health care while still adhering to the DOTS strategy of government.

INTRODUCTION

Socio-economic determinants of tuberculosis.

Tuberculosis from time immemorial has disproportionately caused misery to the poor. Malnutrition, environmental factors such as crowding and poor living condition, unemployment and lack of access to health care are social factors, which are responsible for making tuberculosis the outcome of social misery. This differential risk of tuberculosis in the poor reflected in the annual new tuberculosis infections reported from poor and developing countries as compared to industrialized and developed countries. In developing countries like the Philippines, tuberculosis is the single preventable infectious disease responsible for the greatest morbidity and mortality.

Death due to tuberculosis occurs in 75 persons per day in the Philippines and exerts a significant adverse socioeconomic impact as it affects young adults, which make up the work force of the population. It remains to be the most significant public health problem in the Philippines at the close of the century. In the 1997 nationwide prevalence survey the magnitude of the problem of tuberculosis in the Philippines had only minimally declined since the first survey undertaken 14 years before (Table 1). This finding indicate an ineffective national tuberculosis control program in the country.

The problem of tuberculosis will likewise noted be worse off in the urban poor settlements studied in Metro Manila, Cebu and Cagayan de Oro (Table 2). These findings only underscore that tuberculosis is truly a consumption of the poor. While undoubtedly, the solution of these socioeconomic factors will help curb tuberculosis, the realization of such a goal is dim in the foreseeable future.

In the Beginning.

Tuberculosis is a disease of antiquity. The earliest recorded account of tuberculosis was in 3,400 BC when a case of spinal tuberculosis with an associated psoas abscess was first described in the mummified remains of a Twenty-First Dynasty priest, Nesperahan (Cave, 1939). Its causative agent, *Mycobacterium tuberculosis*, by means of molecular biological methods, is estimated to be approximately 15,000 years old (Kapur, *et al.*, 1994). It took however almost

Table 1. Comparison of the outcome measure in the 1981-1983 and 1997 surveys (Per 1,000)

Outcome measures		1981/1983	1999
Radiologically active*		42	42
Bacillary: Culture-positive	Observed prevalence	12.5	11.2
	standardized	-	9.5
	extrapolated	8.6	8.1
Smear-positive	Observed prevalence	9.5	4.3
	standardized	-	6.0
	extrapolated	6.6	3.1
BCG scar	Observed prevalence	40	66
Tuberculosis infection	Observed prevalence	54.5	63.4
	standardized	66.5	
Annual risk of infection	Per cent	2.5	2.3

**Data adapted from Tupasi et al., (1999)*

2000 years before the organism was eventually demonstrated by the technique of acid fast staining by Robert Koch in March 24, 1882 in what was heralded as the great discovery of the age (New York Times, 1882). Eventually, he demonstrated the causal relationship of the organism and the tuberculosis in what became known as Koch's postulate (Koch, 1882):

> "to prove that tuberculosis is brought about by the tubercle bacilli... the bacilli must be isolated from the body... cultured so long in pure culture that they are freed from any disease production of the animal organism which may still be adhering to the bacilli... the isolated bacilli must bring about the transfer of the disease to other animals."

Early attempts at treatment of tuberculosis

Early attempts at treatment date back to the Greek era where illness was considered to be perturbations of the humoral balance and that therapy then was to redress this imbalance. Being considered to be natural phenomena, remedies the were considered from early sources as dietary enrichments. Subsequent physician-generated remedies included noxious practices such as bleeding, purging, emetics.

From the Roman era until the early part of the 20th century, the triad of rest, nutritious diet and fresh air, which was the basis of sanitoria treatment, became popular (Copper, 1929). About the same time, collapse therapy became a major form of intervention and lasted for about 60 years. This was achieved by artificial pneumothorax through the introduction of nitrogen gas into the chest cavity (Forlanini, 1906), or through the interruption of the phrenic nerve in what was termed as phreniclass, or pneumoperitoneum or the introduction of air into the

Table 2. Observed and estimated prevalence of active pulmonary tuberculosis, culture-positive and smear-positive tuberculosis nationwide and in the urban poor settlements after adjusting for non-coverage by chest radiography and sputum examination.

Characteristic	Observed Prevalence					
	Nationwide[1]			Urban poor settlements[2]		
	Active PTB	Culture +	Smear +	Active PTB	Culture +	Smear +
Male	53	16.4	6.5	85	24.8	14.4
Female	31	6.4	2.1	49	11.3	
Age-group						
10-29	13	4.8	1.9	32	11.8	4.4
30-49	53	18.7	6.3	94	23.2	11.0
≥ 50	103	17.4	7.9	163	31.5	17.0
Observed Population (95% CI)	42 ± 3. 3 (35 – 48)	11.2 ± 1.22 (8.78 – 13.55)	4.3 ± 1. 36 (1.71 – 7.04)	66 ± 5. 6 (54.8 – 77.0)	17.5 ± 2.3 (13.3 – 22.4)	7.1 ± 2. 3 (2.6 – 11.5)
General Population[3] (95% CI)		8.1 ± 0. 88 (6.35 – 9.81)	3.1 ± 0. 99 (1. 24 – 5.10)		12.9 ± 1.7 (9.6 – 16.2)	5.1 ± 1.6 (1.3 – 8.3)

Data from Tupasi et al. (2000)

[1a]Data adapted fro Tupasi *et al.* (1999), Average of the outcomemeasure in individual clusters.

[2] Data adapted from Tupasi *et al.* (2000), all estimates are weighted averages of the averages in Metro Manila, Metro Cebu, and Metro Cagayan de Oro, the weights being respective population sizes, namely 82.1, 16.1 and 1.8 respectively.

[3] Extrapolated to the total population assuming that bacillary disease is unlikely to occur in those younger than 10 years.

abdominal cavity to elevate the diaphragm and impede the expansion of lungs (Mitchell *et al.*,1947).

The Age of Chemotherapy

The first chemotherapeutic agent was para-aminosalicylate (PAS), which was synthesized by Jorgen Lehman, a Danish biochemist in 1943. This compound was the first drug used in the treatment of tuberculosis in March 1944. This drug was given to a young woman with pulmonary tuberculosis with rapidly progressive tuberculous pneumonia from October 1944 to March 1945 with the conversion of her sputum smears to negative, marking the beginning of the age of chemotherapy. Later, Gylfe Valletin successfully used the drug to treat a series of patients with tuberculous empyma.

Streptomycin was discovered by Albert Schatz, a Russian by birth, who worked with Selman Waksman in Rutgers University in New Jersey. This was isolated from cultures of *Streptomyces griseus* and totally inhibited the growth of an avirulent strain of *Mycobacterium tuberculosis* in Lowenstein-Jenssen culture medium. In collaboration with William Feldman from the Mayo Clinic, the drug was demonstrated to be efficacious in guinea pigs with a virulent strain of *M. tuberculosis* H37-Rv. Feldman in collaboration with Corwin Hinshaw later demonstrated that this drug had no significant toxicity and its use in humans infected with *M. tuberculosis* commenced with the treatment of a man with acute military disease who responded but later died from pulmonary embolism and subsequently in the successful treatment of a young woman from November 1944 to April 1945 (Hinshaw and Feldmann, 1945). The additive effect of streptomycin and PAS was eventually demonstrated in the first randomized clinical trial undertaken by the British Medical Research Council (British Medical Research Council, 1949).

A Nobel Prize awarded to Selman Waksman, without any aknowledgement of his collaborating scientists, marked the discovery of streptomycin. However, after the successful lawsuit against Waksman and the Rutgers University, Albert Schatz eventually received the Rutgers University Award 50 Years.