Contribution of Private Sector Hospitals in the Detection and Treatment of Tuberculosis

Carl Abelardo T. Antonio

Department of Health Policy and Administration, College of Public Health, University of the Philippines Manila

ABSTRACT

Objective. To describe the outcomes of implementation of a public-private mix Directly Observed Treatment Short-course (DOTS) strategy for tuberculosis (TB) prevention and control in a highly-urbanized city in the Philippines.

Methods. Data on case-finding and case-holding activities of two facilities engaged as part of the public-private mix DOTS (PPMD) from 2006-2013 were abstracted from reports submitted to, and validated by, the city National Tuberculosis Program (NTP) coordinator. Additionality to local case-finding efforts was measured through case detection and case notification rates, while effectiveness of case-holding mechanisms was measured through determination of treatment outcomes of new smear-positive cases.

Results. A total of 314 cases of tuberculosis (average of 40 cases annually) were reported by the two facilities for the period 2006 to 2013. Most of the discovered cases of TB were new cases (81%). Fifty nine percent (59%) were bacteriologically confirmed TB cases through sputum microscopy. New smear-positive cases of TB increased the local case detection rate by an average of four percentage points for the observation period. In absolute terms, this translates to an addition by private institutions of five new smear-positive cases per 100,000 population to those reported by public facilities from 2006 to 2013. Proportionately, the two private hospitals contributed an average of 5% to the total new smear-positive cases detected in the city from 2006 to 2013. In terms of treatment outcome of the cohort of smear positive patients admitted from 2006 to 2012, seven out of ten cases were cured (mean cure rate of 70%), and nearly all (90%) were successfully treated. Over the observation period, the cure rate among new smear-positive cases increased from 50% in 2006 to 86% in 2012, and was comparable to the national benchmark of 85% in 2011 and 2012. On the other hand, treatment success rates were highly variable, but have remained above the 80% mark starting 2007.

Conclusion. Engaging private healthcare providers to practice DOTS as the main strategy for TB prevention and control has had some modest impact on local NTP accomplishments. Current efforts need to be scaled up to include a wider range of private practitioners. A triple win situation for the patient, the private practitioner and NTP should be the end goal of all such efforts.

Key Words: tuberculosis, public-private sector partnerships, Philippines

Corresponding author: Carl Abelardo T. Antonio, MD, MPH
Department of Health Policy and Administration
College of Public Health
University of the Philippines Manila
625 Pedro Gil Street, Ermita, Manila 1000 Philippines
Telephone: +632 3428932
Fax no.: +632 5232997
Email: ctantonio@up.edu.ph

Introduction

The burden of tuberculosis (TB) among Filipinos remains significant despite more than a decade's implementation of the Directly Observed Treatment Short-course (DOTS) strategy.[1] In the past five years, the Philippines was counted by the World Health Organization (WHO) among 22 high-burden countries for TB globally and has ranked 8th consistently in the past three years, although there has been a considerable decline in TB incidence from 285 per 100,000 population in 2008 to 265 per 100,000 population in 2012.[2-6] This data is consistent with official statistics from the Philippine Department of Health (DOH), which showed that, from 2000 to 2009, TB is the 6th leading cause of morbidity and mortality in the country.[7,8]

One limitation of previous strategies to prevent and control TB was its limited focus on public sector actors (i.e., community health centers and state-owned facilities), to the exclusion of a wider network of private healthcare providers operating outside established national tuberculosis control programs, which, invariably, is the first point of contact for most patients with symptoms of TB in both developed and developing economies alike.[9] Cognizant of this limitation, the WHO proposed an expanded strategy, termed Stop TB, which counts among other strategies, the engagement of all care providers trough public-public and public-private mix approaches.[10] The Philippine Plan of Action to Control Tuberculosis (PhilPACT) formally adopted the same strategy in the local setting in 2010.[11]

This paper describes the outcomes of the implementation of such strategy in a highly-urbanized city the Philippines, and discusses policy and practice implications of private sector engagement in TB prevention and control.

Materials and Methods

Study Setting

City A is a highly-urbanized city in the Philippines' National Capital Region with a considerable burden of tuberculosis. TB ranked as the 6th leading cause of mortality and 10th leading cause of morbidity in the city. An average of 703 cases of TB were reported annually from 2003 to 2008 (morbidity rate of 220 per 100,000 population), while 60 to 130 deaths were attributable to TB during the same period (mortality rate of 32 per 100,000 population).

Two private tertiary hospitals in the city were established as public-private mix DOTS (PPMD) units in 2005 and 2007 through a grant from The Global Fund Against AIDS, Tuberculosis and Malaria to augment DOTS services being provided through more than 10 community health centers owned and operated by the local government.

These institutions perform diagnostic sputum microscopy for both walk-in patients and intra-hospital referrals symptomatic for TB. Diagnosed cases are managed as prescribed in the national protocol for tuberculosis control.[12] Program activities are monitored quarterly by the city TB program coordinator through reports submitted on case-finding and case-holding activities.

Methods

Data on case-finding and case-holding activities of the two PPMD units from 2006-2013 were abstracted from reports submitted to, and validated by, the city NTP coordinator. Specifically, this included data on the types of TB cases diagnosed (i.e., new smear positive, relapse, transfer-in, return after default, treatment failure, other positive, other negative, new smear-negative, extra-pulmonary), and the outcome of treatment of new smear positive cases admitted for DOT for a given year (i.e., cured, completed treatment, died, failed, defaulted, transfer-out). The definitions of these case types and treatment outcomes are summarized in Tables 1 and 2, respectively.

The effectiveness of the PPMD units in identifying patients with tuberculosis were determined through computation of year-specific and average case detection rates (CDR) and case notification rate (CNR) for new smear-positive cases in *public sector only* (designated 'Public' in subsequent sections) and *public and private sectors* (designated 'PPM' in subsequent sections). Furthermore, additionality to city-wide case detection rates for each year and over the observation period was calculated. On the other hand, effectiveness of case-holding mechanisms in the two PPMD units was focused on identifying treatment outcomes for new smear-positive cases registered for each year and over the observation period. These parameters, adopted from the Philippine NTP, are summarized in Table 3 in the next page.

Table 1. Types of TB cases detected through DOTS[12]

Type of TB case	Operational Definition
New	A patient who has never had treatment for TB or who has taken anti-TB drugs for less than one month.
Relapse	A patient previously treated for TB, who has been declared cured or treatment completed, and is diagnosed with bacteriologically positive (smear or culture) TB.
Treatment Failure	A patient who, while on treatment, is sputum smear-positive at five months or later during the course of treatment.
Return After Default (RAD)	A patient who returns to treatment with positive bacteriology (smear or culture), following interruption of treatment for two months or more.
Transfer-in	A patient who has been transferred from another facility adopting NTP policies with proper referral slip to continue treatment.
Other	All cases who do not fit into any of the above definitions. This may also include the following: 1. Other (positive) – a patient who was initially registered as a new smear-negative case and turned out to be smear-positive during treatment; 2. Other (negative) – a patient who interrupted treatment for two or more months and has remained or become smear-negative upon return for treatment; and 3. Chronic case – a patient who remains sputum-positive at the end of a re-treatment regimen.

Table 2. Treatment outcome of TB cases initiated treatment under DOTS[12]

Treatment Outcome	Operational Definition
Cured	A sputum smear-positive patient who has completed treatment and is sputum smearnegative in the last month of treatment and on at least one previous occasion in the continuation phase.
Completed Treatment	A patient who has completed treatment but has not met the criteria for cure or failure. This group includes: • A sputum smear-positive patient who has completed treatment but without DSSM follow-up during the treatment, or with only one negative DSSM during the treatment, or without DSSM in the last month of treatment. • A sputum smear-negative patient who has completed treatment.
Died	A patient who died for any reason during the course of treatment
Failed	A patient who is sputum smear-positive at five months or later during the treatment OR An initially sputum smear-negative patient before starting treatment who becomes smear-positive during the treatment.
Defaulted	A patient who interrupted treatment for two consecutive months or more
Transferred Out	A patient who transferred to another DOTS facility with proper referral slip for continuation of treatment and whose treatment outcome is not known.

Table 3. Operational Definition of Indicators for Program Effectiveness[12]

Indicator	Operational Definition	Formula
Case Detection Rate (CDR) of new smear-positive cases	Ratio of new smear positive cases detected in a given period to estimate of new smear-positive cases for the same period.	$CDR = \frac{No.of\ new\ smear\ positive\ cases\ detected}{No.of\ estimated\ new\ smearpositive\ TB\ cases} \times 100$
Case Notification Rate (CNR) of new smear-positive cases per 100,000 population	Incidence rate of new smear positive cases reported for a given period, assuming a fixed population.	$CNR = \frac{No.of\ new\ smear\ positive\ cases\ reported}{Mid-year\ population} \times 100{,}000$
Additionality (ADD)	Proportion of new smear positive cases detected by PPMD units to total new smear positive cases detected by all reporting units.	$ADD = \frac{No.of\ new\ smear\ positive\ cases\ detected\ by\ PPMD}{Total\ no.of new\ smear\ positive\ cases\ from\ all\ units} \times 100$
Cure Rate (CR) for new smear-positive cases	Proportion of new smear positive cases declared cured among those admitted for treatment in the same period.	$CR = \frac{No.of\ new\ smear\ positive\ cases\ cured\ for\ given\ period}{No.of\ new\ smear\ positive\ cases\ admitted\ for\ period} \times 100$
Treatment Success Rate (TSR)	Proportion of new smear positive cases declared successfully treated (cured and completed treatment) among those admitted for treatment in the same period.	$TSR = \frac{No.of\ new\ smear\ positive\ cases\ successfully\ treated\ for\ given\ period}{No.of\ new\ smear\ positive\ cases\ admitted\ for\ period} \times 100$

Data was encoded in Microsoft® Office Excel (Microsoft Corporation), and analyzed through means, proportions, and rates as described above. Simple tables and graphs were generated to further augment interpretation of derived information.

Results and Discussion

A total of 314 cases of tuberculosis were reported by the two PPMD units for the period 2006 to 2013, or an average of 40 cases annually. The fewest number of cases reported was in 2006 (n=2), or shortly after the first PPMD unit was inaugurated, while the highest number of cases registered was in 2007 (n=65), when the second PPMD unit began its operations.

Most of the discovered cases of TB were new cases (81%) and bacteriologically confirmed TB cases through sputum microscopy (59%) (Figure 1). New smear positive cases make up exactly half of all patients encountered in the PPMD units, while new smear negative patients comprise a third (31%) of these. Notably, retreatment cases comprised only a small fraction of the total cases seen in these private institutions (4%).

These new smear-positive cases of TB, totaling 156 (or an annual average of about 19 cases), increased the local CDR by an average of four percentage points (range: 1% to 7%) for the observation period (Figure 2). From 2006 to 2013, the reported CDR of both public and private facilities was 83%, in contrast to a CDR of 79% for public facilities only. In absolute terms, this translates to an addition by the PPMD units of five new smear-positive cases per 100,000 population to those reported by public facilities from 2006 to 2013 (Figure 3). Proportionately, the PPMD units contributed an average of 5% (range: 1% to 7%) to the total new smear-positive cases detected in City A from 2006 to 2013.

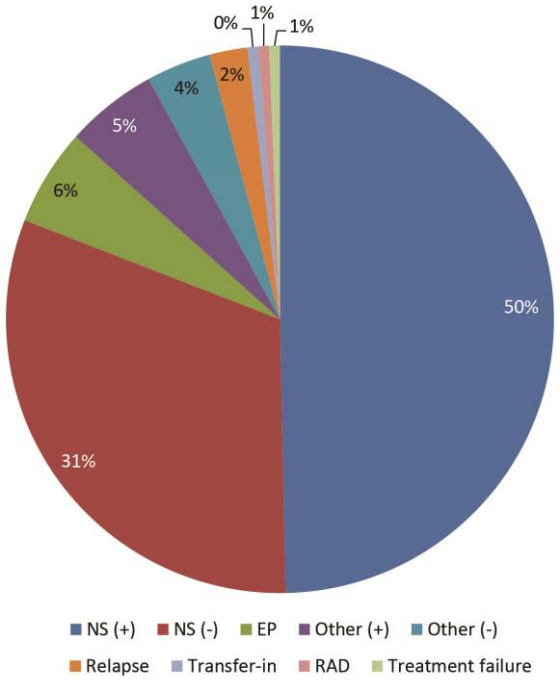

Figure 1. Type of TB cases seen in PPMD units (n = 314), 2006-2013
NOTE: NS (+) = new smear-positive; NS (-) = new smear-negative; EP = extrapulmonary; RAD = return after default.

In terms of treatment outcome of the cohort of smear positive patients admitted from 2006 to 2012, seven out of ten of these were cured (mean cure rate of 70%), and nearly all (90%) were successfully treated (Figure 4). Of note, six patients (5%) were reported to have failed treatment, while eight (6%) defaulted from treatment and were consequently lost to follow-up.

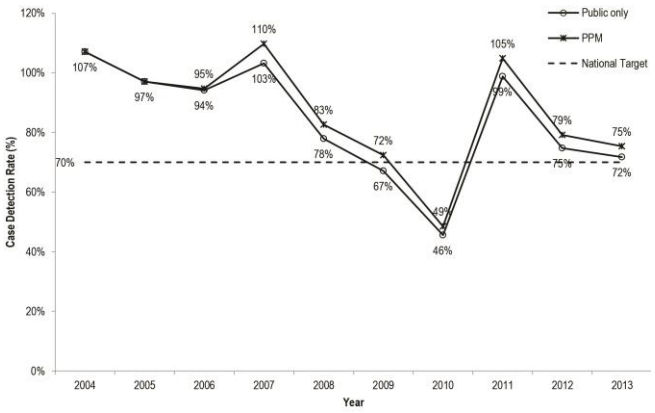

Figure 2. Trend of TB case detection (%), Public only vs Public and Private facilities, 2004-2013

NOTE: Data for 2004 and 2005, the years prior to the establishment of the PPMD units, were plotted for comparison purposes only.

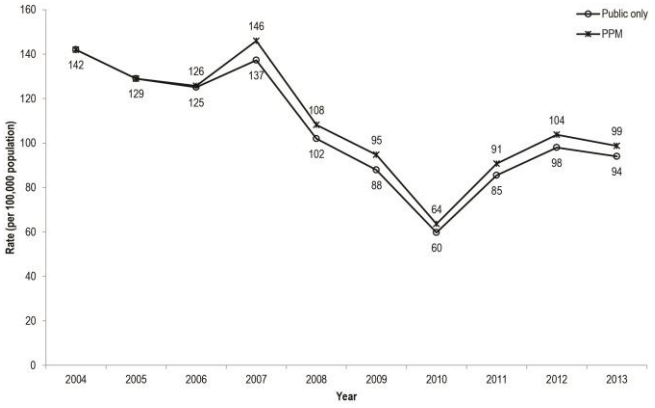

Figure 3. Trend of TB case notification (rate per 100,000 population), Public only vs Public and Private facilities, 2004-2013.

NOTE: Data for 2004 and 2005, the years prior to the establishment of the PPMD units, were plotted for comparison purposes only.

Over the observation period, the cure rate among new smear-positive cases in the two PPMD units increased from 50% in 2006 to 86% in 2012, and was comparable to the national benchmark of 85% in 2011 and 2012 (Figure 5). On the other hand, treatment success rates were highly variable, but have remained above the 80% mark starting 2007.

In summary, the two PPMD units in City A described above had modest contributions to accomplishments of the local TB control program. Specifically, the average increase in local CDR was much lower than the national average for PPMDs of 18%.[12] The average cure rate in PPMD units, while lower than the national target of 85%, are offset by the high proportion of cases completing treatment.

Several factors may explain the variable performance of the two PPMD units thus described.

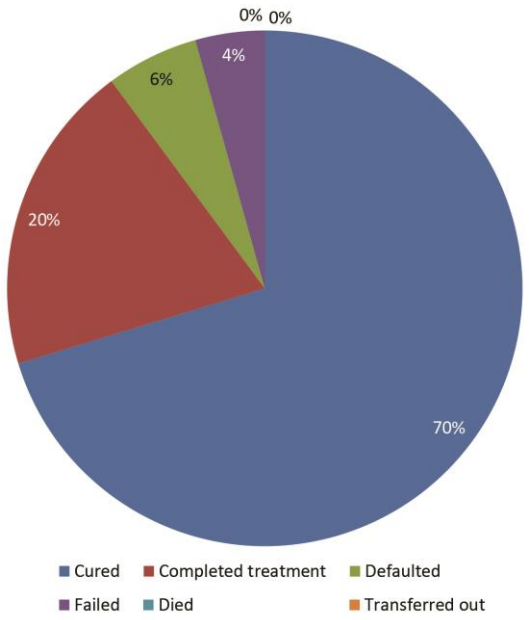

Figure 4. Treatment outcome of new smear-positive TB cases admitted for treatment in PPMD units (n = 138), 2006-2012.

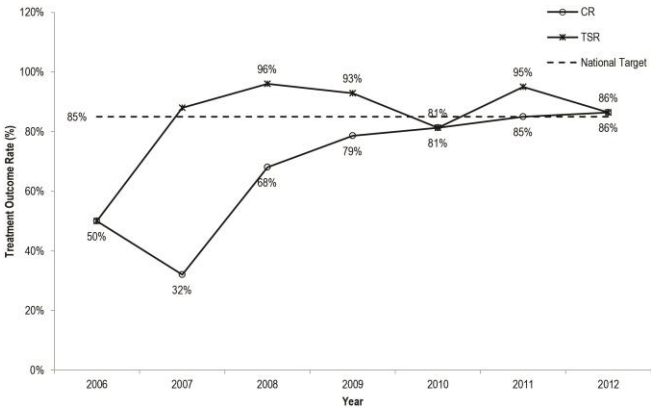

Figure 5. Trends of cure rate and treatment success rate among new smear-positive cases admitted for treatment in PPMD units, 2006-2012.

NOTE: CR = cure rate; TSR = treatment success rate.

First, the client-base of the two private hospitals extends beyond City A to those of neighboring localities. It has been noted that although some patients who are suspected to have tuberculosis are seen in these two institutions, they are not automatically referred to the PPMD units, but are initially counseled regarding the need, should they turn out to be cases of pulmonary tuberculosis, for directly observed treatment in the facility every day for at least six months. Most patients opt for referral to the health centers or private DOTS facilities nearer their place of residence.

Second, DOTS as the strategy for TB control is being practiced only by a limited number of health professionals. Not all attending physicians in the two hospitals studied referred their patients to their respective DOTS units, but initiated treatment instead on their own accord. To a certain extent, patient preference is a factor as treatment from home is more convenient. However, there is also the prevailing notion that doctors in private practice will lose their patients (and consequently, their income) to the PPMD unit should their TB patients be referred for treatment.

Furthermore, while the two PPMD units are situated in tertiary hospitals in City A, there are about 75 to 100 more private family clinics located in the city that are not practicing DOTS. These invariably represent a bigger proportion of health providers who are working outside the framework of the NTP. Some of these physicians have been trained as referring physicians, and have even undergone repeated orientation on NTP. Unfortunately, the lack of a mechanism that would make the practice of DOTS compulsory for all physicians in the city has allowed private practitioners to simply bypass the guidelines on tuberculosis control; thus, community health centers still receive from private healthcare providers referrals of patients who were diagnosed with tuberculosis through a chest x-ray, and who were initiated treatment with non-standard regimens. The reasons for non-compliance with DOTS have been diverse, and range from the physicians prerogative on management of a patient's disease, to outright disbelief and distrust in DOTS as an effective strategy.

The role of the private sector in TB prevention and control is well documented. Patients who have symptoms suggestive of TB first consulted with a private practitioner in about a third to half of instances, and this trend has remained unchanged in the past decade.[11,13] However, practitioners have been noted to deviate from the accepted standards of TB management,[12,14] specifically by diagnosing TB through a chest x-ray, initiating treatment with inappropriate regimens, lack of mechanism for patient follow-up, absence of defaulter tracing systems, and non-identification and examination of contacts of the index case.[15]

While the country is poised to achieve the TB-related millennium development goals in 2015,[16] challenges in totally eliminating the burden of TB among Filipinos will remain unless the full cooperation of the private sector is achieved.[17] The problem takes on a more urgent tone with the rise, both globally and locally, of cases of drug-resistant tuberculosis, most of which arise from inappropriate or inadequate treatment.[6,11]

The current national action plan for tuberculosis control takes all these into consideration, and is envisioning the integration into the NTP of 60% of all private hospitals and 70% of all private practitioners nationwide by 2016 through a variety of mechanisms, such as establishment of referral networks, training of health human resources, advocacy through professional societies, and utilization of financial incentives through the national social health insurance program.[11] Integration and localization of all these mechanisms in a devolved healthcare system of more than 1,600 cities and municipalities spread in an almost similar number of islands throughout the archipelago remains to be seen.

Local governments, however, possess sufficient regulatory powers that can be harnessed to help achieve the goal of a TB-free Philippines. Specifically, this entails local legislation establishing compliance to the NTP as a requirement for licensure of local practitioners and facilities, as enshrined in Executive Order No. 187.[18]

Local health departments also need to broaden their networks with local professional societies to advocate for adoption of NTP by its members. This will entail, on the one hand, proffering the idea that public facilities offering DOTS are partners, instead of competitors, in patient care, and, therefore, adequately addressing and allaying concerns that community health centers will snatch away their patients. On the other, it also poses a challenge for community health centers to be prepared for the possible influx of referrals, i.e., they are able to provide quality services.

This paper presented the results of implementation of a public-private mix model DOTS in a highly-urbanized city, from the program's inception and until seven years later. Thus, there is sufficient evidence to attribute contribution of the private sector to the total local effort in TB prevention and control, taking into consideration the program's initial phase and eventual stabilization. However, it is possible that the results presented in this paper on the additionality of the PPMD units is but a minimum number, as the principal focus was on DOTS-providing facilities (i.e., the two facilities offering diagnosis and case management). A re-examination of the data from public facilities should entail determination of the number of patients referred by private professionals and facilities to the NTP as this is, in its broadest sense, still a contribution of the private sector in TB case-finding.

Engaging private healthcare providers to practice DOTS as the main strategy for tuberculosis prevention and control has had some modest impact on local NTP accomplishments. Current efforts need to be scaled up to include a wider range of private practitioners. A triple win situation for the patient, the private practitioner and NTP should be the end goal of all such efforts.

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