

***Pharmacoeconomic Evaluation of
Tuberculosis Treatment among New
Smear-Positive Pulmonary
Tuberculosis Patients with Patient
Delay in Caloocan City, Philippines***

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A. BACKGROUND OF THE STUDY

Tuberculosis – a major public health
problem globally and locally

- ❑ South-East Asia & Western Pacific : 9.7 M
prevalent TB cases (291/100,00 popln)-
5M incident cases (149/100,000 popln)
- ❑ Philippines : 3rd of 7 high-burden countries
(WPR) and 9th of 22 high-burden
countries in the world

Source : WHO report, 2005

- ❑ **Philippines** – DOTS case detection rate (68% in 2003, WHO's target is 70%)
- ❑ **Passive case-finding** – 1 untreated TB patient can infect 15 others/year
- ❑ **Delay in diagnosis & treatment** – causes spread of TB infection in community, increases severity of disease (mortality), & **increases patient expenditure**

B. Objectives of the study:

General Objective:

- ❑ **to evaluate the pharmacoeconomic impact of TB treatment among new smear-positive TB patients with patient delay in Caloocan City**

Specific Objective:

- to conduct a pharmacoeconomic evaluation of TB treatment with and without patient delay among new smear + TB patients at the **society's perspective** (patient, health system & community) using **cost-benefit analysis**

C. RATIONALE OF THE STUDY

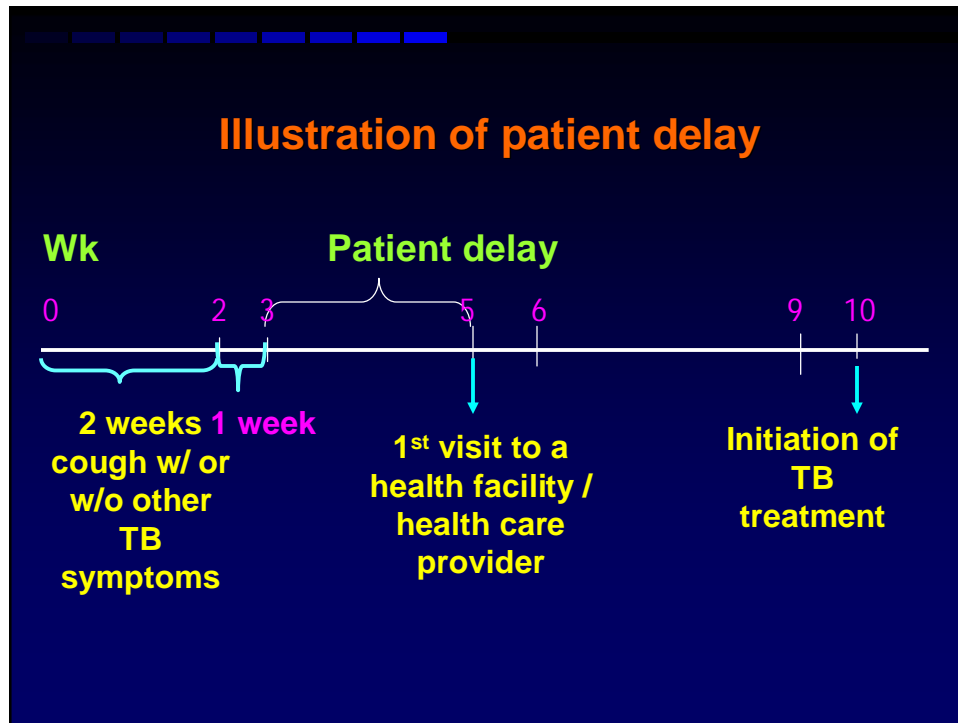
- 1. provide a picture of the costs incurred for TB treatment due to patient delay & benefits of TB treatment without delay at the societal level;*
- 2. the computed net societal gains or benefits will provide an index of the efficiency of service delivery component of the National TB Control Program;*
- 3. program managers, NTP supervisors & policy decision-makers can use the data for recommendations on policy changes to prioritize efforts or interventions of societal benefit.*

D. DEFINITION:

Patient delay – one of the components of treatment delay or delay in the initiation of TB treatment

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Patient delay –time interval (in days) from day 21 after onset of cough with or without the other symptoms of TB to first visit to a health care facility/provider to seek relief.



E. METHODS OF THE STUDY

Study Site – Caloocan City (*3rd largest city in the country*)

- ✓ **40 RHUs:** 25 RHUs in District I & 15 RHUs in District II
- ✓ total population (2006) : 1,392,831

METHODS OF THE STUDY:

Research design : *prospective cohort study of new smear + adult TB patients*

Study population: Inclusion criteria : adult patients (≥ 15 yo) diagnosed as new smear + TB patients who initiated TB treatment within the past 2 weeks in each of the 40 RHUs in CC

DATA COLLECTION :

Patient interview using structured questionnaire

↓

Cost variables at the patient level: *cost of drugs used for symptomatic tx of cough (prescribed & self-medications), for treating complications of untreated TB , anti-TB drugs if purchased & for treating ADRs; doctor's fee; hospitalization cost; cost of lab tests; travel costs, food expenses & cost of lost work & housework productivity for patient ;*

DATA COLLECTION :

Patient interview



Cost variables at the community level:

cost of prophylactic treatment of infected contacts (assumption); cost of paid sick leaves for patients who missed work (for the employer); cost of increased burden in the community due to lost productivity

DATA COLLECTION :

Key informant interviews (*NTP supervisor, medical technologist & RHU nurse*)



Cost variables at the health system level:

cost of lab reagents for routine & repeat sputum smear exam; cost of anti-TB drugs; cost of supplies for routine & repeat smear exams; opportunity cost for staff performing counseling & repeat sputum exams

Data for monetized benefits – derived or computed from cost data from the patients, health care system & community with and without patient delay
(averted costs or savings)

F. DATA ANALYSIS AND RESULTS:

1. Pharmacoeconomic evaluation (Cost-benefit analysis)

1.1 Calculation of Net Gains or Net Societal benefits

Total Costs (w/ & w/o delay) = costs
(patient + health system + community)

Total Benefits (w/ & w/o delay) = benefits or averted costs (patient + health system + community)

NET SOCIETAL BENEFITS (NSB) = total benefits – total costs

I. RESULTS :

1. COST-BENEFIT ANALYSIS (*Societal perspective*)

INTERVENTION	COSTS (Php)	BENEFITS (Php)	NET SOCIETAL BENEFITS (<i>per patient</i>)
TB TREATMENT With PATIENT DELAY	35,765	161	(Php 35,604) (US\$ 791)
TB TREATMENT Without PATIENT DELAY	3,788	28,424	Php 20,923 US\$ 465

IMPACT:

Annual Incidence of new smear + TB patients in 2006 (Caloocan City, Philippines) = 991 patients

With patient delay = Php 36,000/px

Incidence of patient delay = 75%

LOSS (Society) = Php 27 M (US \$ 600,00)

Without patient delay = Php 21,000/px

Incidence of no patient delay = 25%

GAIN (Society) = Php 5 M (US \$ 110,000)

2.2 Discounting

- Process of translating future values into its present worth; convert future values into present to make them comparable ; use **discount factor** $1/(1+r)^n$

$$NPV = \sum_{t=0}^n \frac{(B_t - C_t)}{(1+r)^t}$$

where NPV = net present value

B_t = benefit at time t

C_t = cost at time t

r = discount rate, 3%

n = no. of years (1,2,3,4,5)

DISCOUNTING :

TB TREATMENT	PV 2006 (base year)	PV 2007	PV 2008	PV 2009	PV 2010	PV 2011	NPV
With patient delay	35,604	34,567	33,560	32,583	31,634	30,713	Php 198,661 US\$ 4,415
Without patient delay	20,923	20,313	19,721	19,147	18,589	18,048	Php 116,742 US\$ 2,594

>> NPV>0: preferred intervention (TB treatment w/o patient delay)

2.3 Sensitivity Analysis

- *Technique for exploring the robustness of CBA results to different assumptions*

STEPS:

- ❑ select variables to which net societal benefits may be sensitive
- ❑ recalculate NSB and NPV by varying values of the variables at a range of 5-15% (5-pt increments); use of sensitivity indicator
- ❑ Robust/sound analysis: sign of NSB remains unchanged or NPV >0

Sensitivity Analysis :

- ❑ Variable most sensitive to assumptions or scenarios: *cost of medications (for TB treatment w/o patient delay)*
- ❑ signs of NSBs & NPVs for TB treatment without patient delay did not change (**remained positive**)
- ❑ results are sound & robust

SUMMARY & CONCLUSION :

TB treatment initiated with patient delay :
LOSS to the society

TB treatment initiated without patient delay
BENEFIT to the society



THANK YOU