

ANALYSIS OF FACTORS OF TREATMENT COMPLETION IN DOTS HEALTH FACILITIES IN METRO MANILA, PHILIPPINES : A CASE-CONTROL STUDY

¹Leizel P. LAGRADA, ²Naruo UEHARA, and ¹Kazuo KAWAHARA

Abstract [Study Background and Objectives] The Philippines is one of the 22 countries with high TB burden. DOTS was adopted not only by purely public providers (PP) but also by public-private mix (PPM) facilities. This study aims to identify the patient and facility factors that promote completion of TB treatment in DOTS facilities in an urban setting. The study also explores the difference between the PP and PPM DOTS facilities in terms of case management and treatment outcomes. [Methods] A case control study was done by interviewing 394 patients sampled from TB cohort report between 2003 and 2005 of 14 DOTS facilities in Metro Manila. Statistical analyses used include chi-square test and logistic regression analysis. [Results] Being female and aged 30-44 (OR=7.04; 95%CI 1.12-44.35), unemployed (OR=2.73; 95%CI 1.18-6.33), being above per capita poverty threshold (OR=2.03; 95%CI 1.03-3.99), having experienced at least one of the signs and symptoms of TB (OR=4.64; 95%CI 1.29-16.67), taking the medication at health facility (OR=3.87; 95%CI 1.48-10.16) and patient's understanding of DOT (OR=2.67; 95%CI 1.37-5.23) predict TB treatment completion. Public-private mix type of DOTS facility was also significantly associated with completing treatment ($\chi^2(1)=54.76, p=0.000$). [Conclusion] Patient factors like middle-aged female compared to female aged more than 60, being above per capita poverty threshold, unemployment and having experienced at least one signs and symptoms of TB and facility factors like providing treatment at the facility and explaining the DOT to patient increase the likelihood of completing treatment. Thus, encouraging patients to take their medication at the facility and helping the patients understand the importance of DOT can increase TB treatment completion. The seemingly better DOTS implementation and treatment outcomes by the PPM must be evaluated further through cost effectiveness and efficiency studies.

Key words : Treatment outcome, DOTS, Public-private mix, Case control, Philippines

Introduction

Tuberculosis ranks 6th as the leading cause of morbidity and mortality in the Philippines in 2003¹⁾. Despite four decades of implementing the National Tuberculosis Control Program nationwide, the prevalence of active pulmonary TB has not significantly changed between 1983 and 1997²⁾³⁾. Although the rates of detection and treatment success have improved from 48% to 74% and 88% to 89% between 2000 and 2005, respectively⁴⁾, variations in TB control outcomes exist across

regions with defaulter rates ranging between 2% and 9% and treatment success rates between 83% to 93%⁵⁾. Major constraints to the achievement of TB control targets include under-utilization of DOTS services because of inappropriate health seeking behavior⁶⁾⁷⁾, non-adoption of Department of Health (DOH)-recommended DOTS protocol by private practitioners, and until recently, low case detection rate^{6)~9)}

The Philippine health sector has a large private component. Estimates of individuals with TB symptoms who consult private providers range from 11.8%⁷⁾ to 23%¹⁰⁾. Private

¹Department of Health Policy Science, Graduate School of Tokyo Medical and Dental University, ²Department of International Health, Graduate School of Tohoku University

¹東京医科歯科大学大学院医歯学総合研究科環境社会医歯学系専攻医療政策学講座政策科学分野, ²東北大学大学院医学系研究科社会医学講座国際保健学分野

Correspondence to : Leizel P. Lagrada, Department of Health Policy Science, Graduate School of Tokyo Medical and Dental University, 1-5-45, Yushima, Bunkyo-ku, Tokyo 113-8519 Japan.

(E-mail: lei-hcm@tmd.ac.jp)

連絡先: ラグラダ・リーゼル・パーラン, 東京医科歯科大学大学院医歯学総合研究科環境社会医歯学系専攻医療政策学講座政策科学分野, 〒113-8519 東京都文京区湯島1-5-45

(Received 26 May 2008 / Accepted 9 Sep. 2008)

Table 1 Treatment success and default rates of participating DOTS facilities, 2003–2005

Type of DOTS	Treatment success rate (%)			Default rate (%)		
	2003	2004	2005*	2003	2004	2005*
PP Total	65	69	81	22	16	12
PPMD Total	93	88	92	3	2	0

* Only 2 quarters of cohort 2005 were available during sampling.

PP: purely public PPMD: public-private mix DOTS

doctors see an average of 16 TB patients a month or an average of 14% of their patient load³). Recognizing these conditions, the government encouraged the involvement of private providers in national tuberculosis control efforts through the implementation of public-private mix strategy in 2003. Moreover, more recent policies on accrediting private facilities as TB DOTS clinics and providing insurance coverage for TB treatment through Philippine Health Insurance Program are designed to improve the health system's provision of quality tuberculosis care by increasing the TB case finding and improving the case holding in both public and private sector. With these developments, TB patients can be managed by either public or private providers in health centers, private clinics or hospital outpatient department following the same DOTS protocol.

As both public and private health facilities provide DOTS services, several questions arise. Given that all health facilities provide DOTS services to TB patients, are treatment outcomes for DOTS the same between purely public facilities and public-private mix DOTS? Does the type of DOTS facility (i.e. purely public or private-public mix) affect adherence to treatment? What are the patient and facility factors that affect adherence to TB treatment? If TB DOTS clinic is the recommended model for providing TB care in the country, whether managed by public or private sector, understanding how the patients' respond to and access TB services in these facilities are important. This study identifies the patient and facility factors that promote completion of TB treatment in DOTS facilities in an urban setting. Moreover, this paper explores the effect of type of DOTS facility on treatment completion.

Methodology

Study design and population

Facility selection Health facilities that provide DOTS services are defined in this study as either purely public (health centers managed by Local Government Units) or public-private mix DOTS (either private or public health facilities that are certified by the DOH as public-private mix DOTS, or PPMD). Based on the DOTS registry of DOH in 2006, Local Government Units (LGUs) that have certified PPMD for at least 2 years were identified. Out of 16 cities and 1 municipality in the National Capital Region, only six cities have PPMD facilities in their jurisdiction. Request letters to conduct research were sent to these six cities and four of them agreed to participate in the study. Purely public DOTS centers

from each LGU that have outpatient visits of at least 30/day, and with available DOTS cohort report for the last 3 years (2003–2005) were identified. Two such DOTS facilities were randomly chosen in each participating city. At the same time letters were sent directly to managers of PPMD facilities and six out of 11 PPMD facilities participated in this study. Table 1 shows the summary treatment success and default rates of participating DOTS facilities.

Patient selection Considering that PPMD facilities were certified by the DOH, diagnostic, treatment and reporting procedures in these facilities are assumed to be consistent with the DOTS protocol and are similar to purely public DOTS. A list of patients who completed treatment (both cured and completed) and a list of those who did not complete (defaulted or lost) were constructed from the TB cohort of 14 DOTS facilities between 1st quarter of 2003 and 2nd quarter of 2005. Only new pulmonary TB cases, regardless of smear result, were included in the list. The total number of patients included in the sampling frame was 2265, 55% were from purely public DOTS facilities. As this is a case control study, cases were patients who completed the full course of TB treatment while controls were those who did not finish treatment. A sample size of 385 was needed to achieve 80% power at 0.05 significance level to detect an odds ratio of 2.0. Unmatched sampling was done with a ratio of 5:1 i.e. for every 5 cases, 1 control was selected. Patients were randomly chosen from the list of those who completed treatment and the list of those who did not. The total sample in this study is 394, 329 of which were cases.

Ethical consideration This study was presented to and approved by the DOH Research Ethics Committee. Patient's consent was secured before the interview was conducted.

Data collection and analysis

Survey of selected patients was done between November 2006 to February 2007 using a questionnaire that was designed, pre-tested and translated to Filipino language, which included socio-demographic characteristics, patient knowledge of TB, accessibility of TB care, TB management, and patient satisfaction. The patient's consent was secured before the interview was conducted.

Data were processed and analyzed using SPSS 11.5. Chi-square tests were used to test the association between demographic and socio-economic characteristics and adherence to TB treatment. Logistic regression analysis was done to identify the effect of various factors related to patient

Table 2 Socio-economic characteristics of patients associated with treatment completion

	Variables	Classification of patient	
		Treatment completed n=329	Treatment not completed n=65
Gender	Male	210 (64%)	47 (72%)
	Female	119 (36)	18 (28)
Age	< 30	86 (26)	18 (28)
	30-44	107 (32)	18 (28)
	45-60	88 (27)	12 (18)
	>60*	48 (15)	17 (26)
Education level	Primary level or less	86 (26)	24 (37)
	Secondary level	172 (52)	32 (49)
	Tertiary level and vocational	71 (22)	9 (14)
Work status	No occupation*	104 (32)	11 (17)
	Employed	96 (29)	16 (25)
	Self-employed**	129 (39)	38 (58)
Per capita poverty threshold	Equal or above per capita poverty threshold in Metro Manila (2003)	179 (55)	27 (42)

Statistically significant at $p < 0.05^*$ and $p < 0.01^{**}$

characteristics and DOTS facility in achieving treatment completion. Odds ratio was computed to measure the effects of the different variables to the outcome. Per capita income was estimated from the reported household income in cash and divided by the household size. Patient's per capita income is then compared with the per capita poverty threshold to classify patients as above or below the per capita poverty threshold in year 2003 for Metro Manila¹¹. Knowledge of tuberculosis was based on 4 items : knowledge of at least 3 correct signs and symptoms, cause, transmission, and curability of TB. Excellent TB knowledge means 4 correct answers ; average TB knowledge means 2-3 correct answers and poor TB knowledge means no or 1 correct answer. Other variables were recorded as dummy variables, where 1=yes and 0= otherwise.

In the first regression model (Model 1), socio-demographic variables such as age-and-gender combination, educational level, working status and being equal or above per capita poverty threshold were entered as independent predictors of treatment completion. In Model 2, variables related to respondent's knowledge of TB, health condition and TB management were added. These predictors include poor patient knowledge of TB, having experienced TB signs and symptoms, having treatment partner, patient experiencing side effect and getting explanation for it and place where treatment took place and patient knowledge of DOT.

Results

Patient factors

A total of 394 patients were interviewed for the study, majority was sampled from purely public DOTS facilities (54%). About 10 (2.6%) patients from the original sample of

385 were replaced because patient moved away, the address given was not correct, the patient refused to be interviewed and 2 patients died already. These patients were replaced by the succeeding patient on the sample list. Nine patients initially refused to be interviewed but later on agreed, resulting to 394 instead of 385 sample size. Most of the patients interviewed were male (65%), and the mean age was 41.6 years with age range of 15 to 81 years. Among socio-economic characteristics of patients, only age >60 years [$\chi^2(1)=5.27, p=0.022$], having no occupation [$\chi^2(1)=5.66, p=0.017$] and being self employed [$\chi^2(1)=8.24, p=0.004$] are significantly associated with treatment completion (Table 2). Although some patients who had no signs and symptoms were identified through routine examination in school and prior to employment, patient's experience of at least one of the signs and symptoms of TB is significantly associated with treatment completion [$\chi^2(1)=19.13, p=0.000$]. Generally, patients who completed treatment have average knowledge of signs and symptoms, causality, transmission and curability of TB (Table 3). However, poor knowledge of TB is negatively associated with treatment completion [$\chi^2(1)=7.03, p=0.008$]. Patient's understanding of directly observed treatment also significantly affects treatment completion [$\chi^2(1)=30.6, p=0.000$].

DOTS facility factors

Several variables were used to test the association between treatment completion and facility factors (Table 3). Two of five components of DOTS were tested for association with treatment completion: sputum microscopy to diagnose TB and assigning treatment partner. Although DOTS guidelines state that sputum smear is the standard for diagnosing TB cases, 77% of the patients report having both sputum smear and

x-ray when they consulted for TB. Treatment partner also ranges from health providers (nurse, midwife, volunteer health worker) to family members (parent, sibling, children and in-laws). Having treatment partner is significantly associated with treatment completion [$\chi^2(1) = 5.01, p = 0.032$], but health provider is positively correlated [$\chi^2(1) = 25.95, p = 0.000$] while a family member is negatively correlated with treatment completion [$\chi^2(1) = 27.59, p = 0.000$]. Despite certification of all health facilities as DOTS, not all patients had directly observed treatment. Treatment if done at the health facility significantly affects treatment completion [$\chi^2(1) = 19.20, p = 0.000$].

Some DOTS facilities gave incentives to patients to encour-

age them to complete treatment. These incentives were mainly non-monetary ranging from certificates of treatment completion to Christmas party for the patients and grocery items for the patients. Although usually given at the end of the treatment period, incentive is associated with adherence to treatment [$\chi^2(1) = 4.15, p = 0.049$].

PPMD is positively correlated with treatment completion [$\chi^2(1) = 54.76, p = 0.000$]. Public-private mix DOTS facilities are significantly different from purely public in terms of assigning treatment partner for patient [$\chi^2(1) = 61.02, p = 0.000$], giving TB medication at the health facility [$\chi^2(1) = 100.8, p = 0.000$], explaining the side effects of TB drugs when patients experienced them [$\chi^2(1) = 17.84, p = 0.000$].

Table 3 Patient and facility factors associated with treatment completion

Variables	Classification of patient	
	Treatment completed n=329	Treatment not completed n=65
Knowledge of tuberculosis ^a		
Very good TB knowledge	36 (11%)	2 (3%)
Average TB knowledge	216 (66)	38 (58)
Poor TB knowledge**	75 (23)	25 (38)
Exposure, health condition and health seeking behavior		
Other household members having signs and symptoms of TB	77 (23)	12 (18)
Presence of at least one signs and symptoms of TB***	322 (98)	56 (86)
Delayed consultation of more than 30 days	104 (32)	26 (40)
Type of health facility		
Purely public***	149 (45)	62 (95)
Public-private mix DOTS***	180 (55)	3 (5)
TB management and patient education		
Sputum microscopy done	302 (92)	58 (89)
Treatment partner was assigned*	264 (80)	44 (68)
Anti-TB medication taken at the health facility***	122 (37)	6 (9)
Presence of side effect and side effect explained by health worker ^b	120 (37)	17 (27)
Presence of side effects and side effect not explained by hw ^b	34 (10)	11 (17)
Patient received incentive ^c *	57 (18)	4 (7)
Patient understands the reason for DOT***	242 (74)	25 (38)

Statistically significant at $p < 0.05^*$, $p < 0.001^{**}$ and $p < 0.001^{***}$

^a Four items related to Tuberculosis knowledge were asked: at least 3 correct signs and symptoms of TB, causative agent, transmission and curability. Excellent TB knowledge means 4 correct answers; Average TB knowledge means 2-3 correct answers; Poor TB knowledge means no or 1 correct answer.

^b No response from 3 patients. n=391

^c Patients who answered don't know or cannot remember if they received incentive were not included in the analysis. n=380

Table 4 Factors associated with type of DOTS facilities

Characteristics of DOTS facility (%)	PP n=211	PPMD n=183
Sputum microscopy done	191 (90%)	169 (92%)
TB partner assigned***	133 (63)	175 (96)
Anti-TB drugs given at the facility***	22 (10)	106 (58)
Experienced side effect and side effect explained by health worker***	53 (26)	84 (46)
Gave incentive to patients***	10 (5)	51 (28)
Patient understood DOT***	102 (48)	165 (90)

***Statistically significant at $p < 0.001$

providing incentive [$\chi^2(1)=38.86$, $p=0.000$] and helping the patient understand DOT strategy [$\chi^2(1)=78.48$, $p=0.000$] (Table 4).

Factors that predict completion of TB treatment under DOTS

Six factors that predict TB treatment completion were identified (Table 5). Female aged 30 to 44 years are more than seven times more likely to complete treatment compared with female older than 60 years. Unemployed patients are almost three times as likely as the self-employed patients to complete treatment. Patients who are above the per capita poverty threshold are a little more than twice as likely as those under per capita poverty threshold to complete treatment. Those patients who experienced at least one sign or symptom of TB are more than four times more likely to complete TB treatment. Among the facility factors, taking the medication at the facility increases the odds of patient completing treatment by almost fourfold while patient's understanding of DOT increases treatment completion by almost threefold.

Discussion

The Philippines is the second high burden country to achieve the goals of 70% case detection and 85% treatment success for TB control for cohorts 2003 and 2004⁽²⁾, but

national improvements in TB control indicators conceals an underlying disparities across regions⁽⁵⁾. Understanding why patients do not complete treatment is therefore important since TB treatment is a long dynamic process affected by interactions among structural, personal, societal and health service factors⁽¹³⁾. This study shows that when patient understands his/her illness and treatment and the facility's management of TB cases and health education strategies are patient-centered, then treatment completion is significantly enhanced. Moreover, this study provides evidence that although DOTS are supposedly being adopted by all facilities studied, the difference in implementation between purely public and PPM DOTS facilities seems to result to different treatment outcomes. However, there are several caveats that should be considered in this study. Firstly, the result of increased likelihood in completing treatment among those who took their anti-TB medication at the health facility should not be taken as an evidence to discourage community DOTS especially for patients who are unable to go to the health facility because of old age or infirmities. Significant association between having a treatment partner and completion of treatment is a positive sign that should be emphasized in community-based DOTS. Secondly, although TB management in PPMD facilities show high correlation with treatment completion, this result should

Table 5 Determinants of adherence to TB treatment in DOTS facilities in Metro Manila

Explanatory Variables	Model 1 OR [95%CI]	Model 2 OR [95%CI]
Age and gender combination¹		
Male aged under 30 yrs	1.42 [0.42–4.74]	1.26 [0.33–4.85]
Female aged under 30 yrs	3.40 [0.82–14.06]	2.30 [0.48–10.94]
Male aged 30–44 yrs	1.47 [0.46–4.73]	0.98 [0.28–3.52]
Female aged 30–44 yrs	10.71 [1.87–61.38]**	7.04 [1.12–44.35]*
Male aged 45–59 yrs	3.14 [0.93–10.64]	1.84 [0.47–7.19]
Female aged 45–59 yrs	6.95 [1.22–39.47]*	5.14 [0.82–32.25]
Male aged over 60 yrs	1.80 [0.54–6.04]	1.19 [0.30–4.31]
Educational level²		
Primary level and below	0.63 [0.25–1.59]	0.68 [0.24–1.93]
Secondary level	0.87 [0.38–2.00]	0.80 [0.32–2.00]
Working status³		
No employment	2.90 [1.33–6.32]**	2.73 [1.18–6.33]*
Employed	1.64 [0.81–3.34]	1.57 [0.72–3.42]
Equal/above per capita poverty threshold in Metro Manila (2003)	1.57 [0.85–2.88]	2.03 [1.03–3.99]*
Poor TB knowledge		0.68 [0.34–1.37]
Presence of at least 1 sign/symptom		4.64 [1.29–16.67]*
Experienced side effect of drug⁴		
Having side effect and explanation provided by health worker		0.97 [0.45–2.07]
Having side effect but no explanation provided by health worker		0.81 [0.31–2.01]
Having treatment partner		1.45 [0.68–3.07]
Treatment taken at the health facility		3.87 [1.48–10.16]**
Patients' knowledge of DOT		2.67 [1.37–5.23]**
-2 Log likelihood	309.76	266.16
Prob > χ^2	0.003	0.000
R²	0.127	0.296

All values in bold font are statistically significant at $p < 0.05^*$ and $p < 0.01^{**}$.

Reference variables are female aged over 60 yrs¹, tertiary and vocational level², self-employment³, and experienced no side effect⁴.

be taken with caution as more studies must be done to evaluate the effectiveness and efficiency of PPM over purely public facilities. This study was also limited by the sample size and the findings of this study could be stronger with larger sample size but tracing patients was difficult, particularly for patients who did not complete treatment. The sample size could have been larger if all qualified PPM in Metro Manila participated in the study. The patients were sampled from the TB registry from 2003 to 2005 of study facilities, thus findings may be affected by recall bias.

Findings that personal factors like being female, middle age, employment status and higher income are important factors in completing treatment¹⁴⁾¹⁵⁾. These factors are known to affect patient's motivation and motivated patients are more likely to finish treatment. Moreover, patients who finished treatment are more knowledgeable about tuberculosis than those who did not complete treatment. The significant effect of understanding the side effects of drugs and DOT process on completing treatment is consistent with earlier studies¹⁶⁾¹⁷⁾. These findings underscore the importance of increasing patient's knowledge about their health and treatment¹⁸⁾.

Previous studies presented conflicting evidence on the effect of DOT strategy in promoting treatment completion. Some studies lauded the importance of directly observing the patient while they take their medication¹⁹⁾²⁰⁾ while other studies demonstrated the opposite²¹⁾²²⁾. In the Philippines where treatment partner may be any of the following, midwife or nurse in the health center, volunteer health worker, local government official, former TB patient, or member of the patient's family²³⁾, this study confirms the importance of treatment partner in promoting positive treatment outcome. Moreover, this study also identifies DOT treatment in a health facility (measured as medication taken at health facility) and patient's health education for TB treatment (measured as patient's understanding of DOT) as predictors of treatment completion. These findings support the idea that directly observed treatment should be supported by other factors that promote adherence like improved patient education, good quality of communication between patients and health providers and other interventions that strengthen health service delivery²⁴⁾. These findings also support the strategies identified in the Philippine National Tuberculosis Control Program Manual of Procedures²⁵⁾ where health education and directly observed treatment are emphasized to improve treatment adherence.

The private sector has contributed an additional 3% increase in case detection rate through the established PPMD nationwide³⁾. The results of this study shows that there are significant differences between purely public and PPM DOTS facilities in terms of managing TB cases and such differences seem to lead to differences in treatment completion. However, caution must be exercised in drawing conclusion from these results. The differences between PP and PPM in terms of patient load, the extent at which DOTS facilities track and

treat defaulters and other structural inputs were not analyzed in this study. However, based on the interviews of DOTS providers, one of the PPMD facilities would do extraordinary measures to track lost patients to ensure that default rate will be kept at a minimum. As example, this facility would provide living accommodations for a transient patient, i.e. a patient who only came to Metro Manila for TB treatment. Considering that PPMD would go to such lengths as to prevent patient from defaulting, cost effectiveness and efficiency studies must be done comparing these two major providers of DOTS. Meanwhile, the results suggest that strengthening the PP facilities in terms of consistently assigning treatment partners, explaining the side effects of TB drugs and the importance of DOT to patient and encouraging patients to take their medications at the health facility whenever possible may lead to better treatment outcomes in PP facilities.

The positive effect of incentives on improving treatment completion is consistent with previous studies^{26)~28)} but more studies need to be done before this strategy can be included as an integral part of DOTS management in the Philippines. As Belo and colleagues showed that the main incentive to improve treatment adherence in Rio de Janeiro is health service support, reflecting the patient's preference for better health services, it is also important to define which among the incentives currently being provided in DOTS facilities have a significant impact on treatment completion.

Conclusion

This study shows patient and facility factors that are associated with completing TB treatment. Patient factors like middle-aged female compared to female aged more than 60, being above per capita poverty threshold, unemployment and having experienced at least one signs and symptoms of TB are predictors of completing treatment while facility factors like providing treatment at the facility and explaining the DOT to patient increase the likelihood of completing treatment. Although having treatment partner is not a significant predictor of treatment completion, it is significantly correlated with positive treatment outcome. Thus, ensuring that DOTS facilities assign treatment partners, encouraging the patients to take their medication at the facility and helping the patients understand the importance of DOT may increase TB treatment completion. The seemingly better DOTS implementation by the PPM must be evaluated further through cost effectiveness and efficiency studies.

Acknowledgement

We sincerely thank the respondents for allowing us to interview them. We are grateful to the Local Government Units, their health officers and volunteer health workers for assisting us in identifying and tracking respondents for this study. Likewise we highly appreciate the PPMD units for participating in and assisting us in this study. We thank Ms. Maricel Gallardo for helping us interview patients, Mr.

Hamano of H-stat for statistical advice and Dr. Tewartit Somkotra for assisting us in our analysis. We are also grateful for the support of Health Policy Development and Planning Bureau and the Infectious Disease Office under the National Center for Disease Prevention and Control of the Department of Health. The financial support through a research grant from Japan Ministry of Health Labor and Welfare is gratefully acknowledged.

References

- 1) DOH. Philippine Health Statistics : Department of Health. Manila, Philippines, 2003.
- 2) Tupasi TE, Radhakrishna S, Rivera AB, et al. : The 1997 Nationwide Tuberculosis Prevalence Survey in the Philippines. *Int J Tuberc Lung Dis.* 1999 ; 3 : 471–477.
- 3) Clinical Practice Guidelines for the Diagnosis, Treatment, Prevention and Control of Tuberculosis in Adult Filipinos : 2006 UPDATE. Manila, Philippines : Philippine Society for Microbiology and Infections Diseases, Philippine College of Chest Physicians, Philippine Coalition Against Tuberculosis, Philippine College of Physicians, Philippine College of Radiology, Philippine Academy of Family Physicians, Philippine College of Occupational Medicine, Department of Health, 2006.
- 4) WHO : Global tuberculosis control : surveillance, planning, financing WHO Report 2008 : World Health Organization, 2008.
- 5) DOH : National Tuberculosis Control Program : Cohort Report 2003–2005, 2005.
- 6) Auer C, Sarol J, Jr., Tanner M, et al. : Health seeking and perceived causes of tuberculosis among patients in Manila, Philippines. *Trop Med Int Health.* 2000 ; 5 : 648–656.
- 7) Tupasi TE, Radhakrishna S, Co VM, et al. : Bacillary disease and health seeking behavior among Filipinos with symptoms of tuberculosis : implications for control. *Int J Tuberc Lung Dis.* 2000 ; 4 : 1126–1132.
- 8) Mantala MJ : Public-private mix DOTS in the Philippines. *Tuberculosis (Edinb).* 2003 ; 83 : 173–176.
- 9) Portero JL, Rubio M : Private practitioners and tuberculosis control in the Philippines : strangers when they meet? *Trop Med Int Health.* 2003 ; 8 : 329–335.
- 10) Wong J, Aldaba B, Gorra E, et al. : The Philippine Private Sector Drug Facility : A Need and Supply Situation Study. Pasig City : Philippine Tuberculosis Initiative for Private Sector Project, 2004.
- 11) NSCB : Explanatory Notes on the 2003 Poverty Estimates : National Statistical Coordination Board, 2005.
- 12) WHO : Global Tuberculosis Control : Surveillance, Planning, Financing WHO Report 2006 : World Health Organization, 2006.
- 13) Munro SA, Lewin SA, Smith HJ, et al. : Patient adherence to tuberculosis treatment : a systematic review of qualitative research. *PLoS Med.* 2007 ; 4 : e238.
- 14) Shargie EB, Lindtjorn B : DOTS improves treatment outcomes and service coverage for tuberculosis in South Ethiopia : a retrospective trend analysis. *BMC Public Health.* 2005 ; 5 : 62.
- 15) Balbay O, Annakkaya AN, Arbak P, et al. : Which patients are able to adhere to tuberculosis treatment? A study in a rural area in the northwest part of Turkey. *Jpn J Infect Dis.* 2005 ; 58 : 152–158.
- 16) Bam TS, Gunneberg C, Chamroonsawasdi K, et al. : Factors affecting patient adherence to DOTS in urban Kathmandu, Nepal. *Int J Tuberc Lung Dis.* 2006 ; 10 : 270–276.
- 17) Mishra P, Hansen EH, Sabroe S, et al. : Adherence is associated with the quality of professional-patient interaction in Directly Observed Treatment Short-course, DOTS. *Patient Educ Couns.* 2006 ; 63 : 29–37.
- 18) O'Boyle SJ, Power JJ, Ibrahim MY, et al. : Factors affecting patient compliance with anti-tuberculosis chemotherapy using the directly observed treatment, short-course strategy (DOTS). *Int J Tuberc Lung Dis.* 2002 ; 6 : 307–312.
- 19) Yew WW : Directly observed therapy, short-course: the best way to prevent multidrug-resistant tuberculosis. *Chemotherapy.* 1999 ; 45 Suppl 2 : 26–33.
- 20) Rodger AJ, Toole M, Lalnuntluangi B, et al. : DOTS-based tuberculosis treatment and control during civil conflict and an HIV epidemic, Churachandpur District, India. *Bull World Health Organ.* 2002 ; 80 : 451–456.
- 21) Khan MA, Walley JD, Witter SN, et al. : Tuberculosis patient adherence to direct observation : results of a social study in Pakistan. *Health Policy Plan.* 2005 ; 20 : 354–365.
- 22) Radilla-Chavez P, Laniado-Laborin R : Results of directly observed treatment for tuberculosis in Ensenada, Mexico : not all DOTS programs are created equally. *Int J Tuberc Lung Dis.* 2007 ; 11 : 289–292.
- 23) DOH : Comprehensive and Unified Policy for TB Control in the Philippines. Manila : Department of Health and Philippine Coalition against Tuberculosis, 2003.
- 24) WHO : Adherence to Long-Term Therapies : Evidence for Action. Geneva : World Health Organization, 2003.
- 25) DOH : Manual of Procedures National Tuberculosis Control Program : Department of Health, Manila, Philippines, 2001.
- 26) Davidson H, Schluger NW, Feldman PH, et al. : The effects of increasing incentives on adherence to tuberculosis directly observed therapy. *Int J Tuberc Lung Dis.* 2000 ; 4 : 860–865.
- 27) Bock NN, Sales RM, Rogers T, et al. : A spoonful of sugar... : improving adherence to tuberculosis treatment using financial incentives. *Int J Tuberc Lung Dis.* 2001 ; 5 : 96–98.
- 28) Belo MT, Selig L, Luiz RR, et al. : Choosing incentives to stimulate tuberculosis treatment compliance in a poor county in Rio de Janeiro state, Brazil. *Med Sci Monit.* 2006 ; 12 : PH1–5.

フィリピン、マニラ首都圏に存する DOTS 施設での治療完了に影響する 因子に関する調査研究

ラグラダ・リーゼル・バーラン, 上原 鳴夫, 河原 和夫

要旨:〔目的〕 マニラ首都圏での DOTS の成否に関連する患者と医療機関双方の要因を調べた。〔対象〕 2003年から2005年にかけて14カ所の DOTS 施設の登録結核患者394人に対してインタビューし、治療完了群と非完了群について症例対照研究を実施した。解析は χ^2 検定とロジスティック回帰分析を用いた。〔結果〕 患者側因子は中年女性、貧困ラインを越えている者、結核症状自覚者、医療従事者の治療パートナーを有する者等が、結核治療を終了する割合が有意に高かった。医療機関側因子としては、政府が運営し DOTS を提供している公的医療機関 (Purely public DOTS facilities) より政府が民間医療機関と協力して DOTS を行っている施設 (Public-private mix DOTS facilities) で、DOTS について患者に十分に説明している施設で治療完了者が多かった。〔考察〕 社会経済因子に加えて結核治療の完遂には患者および医療側の結核に関する正しい知識の理解や普及の程度が関係し、個人および施設間格差を招来すると考える。〔まとめ〕 今後、これらの因子を考慮しながら、医療施設の特性に応じた結核対策を推進する必要がある。

キーワード: 治療成績, DOTS, Public-private mix, 症例対照研究, フィリピン