

Effective TB Control in Thailand: Family DOT vs. Non-Family DOT

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Introduction

According to World Health Organization (WHO), Thailand has been ranked as one of the fourteen countries in all the three high-burden country lists; the 30 high TB burden countries, the 30 high TB/HIV (Human Immunodeficiency Virus) burden countries, and the 30 high MDR-TB (multi-drug resistant TB) burden countries¹. Even though DOTS (Directly-Observed Treatment, Short-course) has been implemented to combat TB in Thailand since 1996² with further geographically covered the whole country in 2002, the notification of TB number seemed to be increasing¹. DOT (Directly Observed Treatment), as the essential element in the internationally recommended policy package for TB control, means that an observer watches the patient swallowing their tablets³. DOT should no longer be debated whether it is worth conducting for treating TB patients or not⁴. However, the majority of DOT practices in Thailand from the beginning of implementation were family DOT⁵⁻⁶. Simultaneously, a Non-Family DOT model has been developed in upper Southern Thailand since 1999⁷. However, both family and non-family DOT have been inconsistently recommended in different WHO's documents and guidelines for TB case management⁸⁻⁹. The objective of the review is to find out whether the family DOT should actually be conducted to control TB in Thailand.

Methodology

The national and international TB guidelines were reviewed about the recommendations of DOT focusing on family members. TB articles on DOT with various types of observer in Thailand, both nationally and internationally, were searched by Google Scholar, and then reviewed about the DOT practices and TB treatment outcomes.

Results and Discussion

Since 1995, the majority of published articles regarding DOT in Thailand have shown that the family DOT was widely practiced in the country, ranged from 51.79 up to 100% (Table 1)^{5-6,10-12}. These were in line with the guidelines of National TB Program (NTP) of Thailand, which consistently recommended the family members as an option of DOT observer¹³⁻¹⁵, except the latest NTP guideline of Thailand in 2018, which has already removed family members from the list of DOT observer options¹⁶. The treatment outcomes of high-proportion family DOT varied from one to another reports, 47.42 – 90.8%^{5-6,10-12}, possibly depend on the quality of the TB control program management in the certain local areas, or might result from the Hawthorne Effect^{10,17}.

However, a Non-Family DOT Model in upper Southern Thailand has been simultaneously developed in 1998 (Table 1)^{7,18}, based on the experiences of poor performance

of family DOT. In addition, the recommendations of US-CDC (Centers for Disease Control and Prevention of the United States of America)'s 1994 guideline¹⁹ (Table 2) has been reviewed. The US-CDC guideline¹⁹ has described as followed:

Table 1. TB articles regarding family and non-family DOT in Thailand

No.	TB articles Authors Year published Main province (s)	Proportion of DOT observer					Comparison group	Results
		HP or HW	VHV	Others	FM	Total		
1	Y Kasetjaroen <i>et al.</i> 1995 Yala ⁵	0%	0%	0%	100% (n = 120)	n = 120	No observer 100% (n = 112)	Completion rate: -Family DOT 90.8% -No observe 80.4%
2	S Kungsaworn <i>et al.</i> 1997 Khon Kaen ⁶	0%	0%	0%	100%	Smear-positive: -New: n = 51 -Retreatment: n = 15	No observer 100% (the previous year) - New: n = 61 - Retreatment: n = 8	Cure rates: - New: DOTS 82.35% Control 75.41% - Retreatment: DOTS 73.3% Control 84.5%
3	P Kamolratanakul <i>et al.</i> 1999 Four provinces from four geographical regions ¹⁰	24/410 (5.85%)	34*/410 (8.29%)	0%	352/410 (85.85%)	n = 414**	No treatment supervision (n = 422)	Cure: -DOT 76% -Self-supervision treatment (SS) 67%
4	S Akkslip <i>et al.</i> 1999 Yasothorn ¹¹	16/184 (8.70%)	1/184 (0.54%)	0%	167/184 (90.76%)	n = 184	Self-administration treatment (n = 78)	Cure rates: -DOT 85.2% -Self-administration 70.9%
5	P Rattanasuwan <i>et al.</i> 2002 Nakhon Si Thammarat ⁷	88.8%	4.68%	2.52%	3.96%***	n = 278	None	Cure rate 80.6%
6	K lemrod <i>et al.</i> 2004 Tak ¹²	6.06 – 38.46%	0 – 5.13%	4.62 – 7.07%	51.79 – 86.87%	-2001: n = 195 -2002: n = 163 -2003: n = 198	None	Cure rate 47.42 - 54.44% (2001-2003)
7	P Rattanasuwan <i>et al.</i> 2015 Nakhon Si Thammarat ¹⁸	95%	4.2%	0.7%	0%	n = 454****	None	Cure rate 81.1%

Remarks: DOTS = Directly-Observed Therapy, Short-course; DOT = Directly-Observed Treatment or Therapy; HP = health personnel; HW = health worker; VHV = village health volunteer; FM = family member
*including other community members; **Information on the type of treatment observer was available for 410.;
classified as no observer in the article; *One case, or 0.2%, was a primary defaulter.

Table 2. International TB documents and guidelines regarding family DOT

No. [Ref.]	TB guidelines/documents	Details on family DOT
1	US CDC (1994): Improving Patient Adherence to Tuberculosis Treatment, Revised 1994 (Page 21) ¹⁹	Pozsik warned that it is not desirable to delegate this responsibility to the patient's family members. Because of the emotional ties some family members have with the patient, the family may be unwilling to ensure that the patient takes the medications when the patient resists treatment.
2	WHO (1996): Groups at Risk: WHO Report on the Tuberculosis Epidemic 1996 (Page 20) ⁸	With the DOTS strategy, the patient swallows the medicines under the watchful eye of a health worker, community volunteer, or even a trusted family member.
3	WHO (1998): Tuberculosis Handbook (Page 74-75) ⁹	A person who is responsible for directly observed treatment should be always accessible to the patient and accountable to the health service. S/he can be a health or social development community volunteer, schoolteacher or community leader. Family members are less suitable for this role since they are less accountable to the health service than persons outside the family home.
4	WHO (2003): Treatment of Tuberculosis: Guidelines for National Programmes, Third Edition (Page 49) ³	In general, members of the patient's family should not serve as treatment observers.
5	WHO (2010): Treatment of Tuberculosis: Guidelines – 4 th Edition (Page 78) ²⁹	Cured TB patients may be successful DOT providers, as can traditional healers, friends, co-workers, family members, neighbours, religious leaders, etc. (15)
6	WHO (2017 update): Treatment of Tuberculosis: Guidelines for treatment of drug-susceptible tuberculosis and patient care (Page 21) ³⁰	DOT administered by trained lay providers or health-care worker is recommended over DOT administered by family members or unsupervised treatment (Conditional recommendation, very low certainty in the evidence);

Remarks: TB = tuberculosis; DOT = Directly-Observed Treatment; US CDC = Centers for Disease Control and Prevention, United States of America; WHO = World Health Organization

Pozsik warned that it is not desirable to delegate this responsibility to the patient's family members. Because of the emotional ties some family members have with the patient, the family may be unwilling to ensure that the patient takes the medications when the patient resists treatment.

Our own experiences on family DOT during 1996-1997 are in accordance with the US-CDC's recommendations in 1994. The majority of family members could not actually practice DOT for TB patients. Daughters could not provide DOT for their fathers. Mothers could not insist their sons to take TB medicines. Even among husband-and-wife couples, DOT could not really be conducted. Our findings should reflect the emotional ties among family members, which have been described in the recommendations of

US-CDC. Thus, the Non-Family DOT Model has been developed to improve the quality of TB case management, and found that the proportion of DOT by health personnel was as high as 88.8%⁷ in the early stage of the model, and up to 95% in the full-scale model¹⁸, while other studies in all geographic regions of Thailand showed the proportion of health-personnel DOT in only 0-38.46%^{5-6,10-12}. It reflects that DOT by health personnel is feasible and practical under program management at the district level, even in the urban setting¹⁸. However, we have found that many measures are needed to conduct to accomplish DOT operation, for instance, intensive negotiation with providing sufficient information to TB patients to accept DOT service at health facilities, effective TB-drug-delivery network in the district,

suitable and functional DOT corners, closed collaboration and regular meeting between the hospital with all primary care units (PCUs) of sub-district level, supervision from district level to sub-district level, and so on²⁰⁻²¹.

Furthermore, the non-family DOT is more accountable and sustainable than family DOT¹⁸ because the performance of health personnel can be systematically monitored, and the health personnel can cumulatively gain the experiences on DOT so as to practice DOT more effectively for the next TB patient²³. However, in the early stage of providing DOT for the first few cases, the understanding of the TB patient is the most important issue. But the understanding of health personnel should be assured first²¹. Otherwise, the health personnel cannot advise the TB patient to understand why the patient needs to come every day to receive DOT service at the health facility. If both the health personnel and the TB patient understand clearly about DOT, the distance from the patient's home to the health facility and the number of health personnel at the health facility are no longer the limitation of concern.

However, it was difficult to expand the Non-Family Model in Thailand because the previous Thai national guidelines persistently recommended family DOT as an observer option¹³⁻¹⁵. As a result, in the real field practice, both the health personnel and the TB patient were willing to choose the family member, instead of the health personnel, to conduct DOT because it was not the burden of daily work of the health personnel, and the TB patient was not necessary to go every day to the health facility to receive DOT. It resulted in the high proportion of family DOT in many areas in Thailand, nearly 100% of family DOT, and even 100% in most settings.

However, when we considered the TB situation in Thailand after DOTS implementation, the trend of notification number of new and relapse TB cases was still on the rise continuously from 49,656 in 2001 to 80,160

in 2017^{1,24} (about 61% increase in 16 years). While the TB incidence of USA was decreasing year by year from 26,673 in 1992 to 9,406 in 2014 (64.74% decrease in 22 years)²⁵, following the 1994 US-CDC guideline, which has recommended that DOT should not be delegated to family members. Even though the family DOT was conducted in some parts of the world²⁶⁻²⁸, we should learn from our own experiences and the success stories from some countries, particularly USA.

Regarding WHO's TB documents and guidelines, they have recommended the family DOT in some issues, while have not in some others (Table 2)^{3,8-9,29-30}. However, the WHO guidelines in 2010 and 2017 have still provided the evidence-based recommendations for the family DOT²⁹⁻³⁰, which made the non-family DOT much more difficult to promote in Thailand and might result in the increasing reported TB cases, in contrast with that of USA. Even though almost all contributing factors on TB situations in USA and Thailand might not be completely comparable, we believe that the emotional ties among family members are similar in both countries, and even similar all around the world. The non-family DOT should be the key success of TB control, as learned from USA, and it should be recognized as the national policy. The Thai national guideline should recommend that the family member should "NOT" be the DOT observer. In addition, the TB cases with family DOT should "NOT" be taken into account as DOT. So, the health personnel need to practice DOT themselves, or in the case of actual necessity, they need to seek more suitable and accountable persons outside the patient's family to provide DOT²². With the non-family DOT, we can take the first step of TB control as the turning point to be the community culture (or community discipline) of TB treatment²³. Furthermore, we expect that we can conduct TB control effectively and actually end TB in Thailand.

Conclusions

With our own experiences on the family DOT and thanks to the recommendations of US-CDC's guideline in 1994 regarding the emotional ties among family members, we have learned that the non-family DOT is feasible in the real practice in Thailand, and it can be the turning point to the key success of TB control to end TB in Thailand.

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