BACKGROUND

Tuberculosis (TB) is one of the diseases that affect a large number of world's population, including those of Thailand where TB is still one of the leading causes of morbidity and mortality. While the country has been combating with TB among general population and has demonstrated a certain level of success in TB control, gaps still remain in hard-to-reach marginalized population groups. Of whom, migrant population is one of the concerned groups. Although the TB prevalence among migrant population is approximately two to three times higher than Thai population, their limited access to health information and healthcare services in Thailand are big challenges for controlling TB among them. It is estimated that there are between two to three million labor migrants in Thailand – majority of whom are of Myanmar origin – and therefore, it is less likely that Thailand will achieve its "Healthy Thailand" Goal without addressing the health needs among the large number of this sub-population group in the country.

Accordingly, World Vision Foundation of Thailand (WVFT) has been implementing the *"Reduction of Tuberculosis Morbidity among Non-Thai Migrants in Six Border and Adjacent Provinces of Thailand" (TB- RAM) Project* in 14 migrant-populated districts in six border provinces as shown in Figure 1, namely: Tak (Maesot District), Kanchanaburi (Sangkhlaburi and Thongphaphoom Districts), Ranong (Muang and Kraburi Districts), Chumporn (Muang, Tasae, and Langsuan Districts), Phang Nga (Kuraburi, Takuathung, Takuapa, Taimuang Districts), and Phuket (Muang and Kathu Districts). The Project is funded by the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFTAM), Round 6. It aims to provide TB knowledge to some 235,000 migrants in the targeted areas as well as to conduct community-based interventions to increase effectiveness of the TB treatment among targeted migrants in need of the service. In collaboration with two implementing partners (IPs) – the American Refugee Committee International (ARC) and the Kwai River Christian Hospital (KRCH) – the Project is to be implemented for a period of five years, from October 2007 - September 2012.

Figure 1. Map of TB-RAM Project Targeted Areas

RESEARCH OBJECTIVES

Overall, the purpose of this operation research (OR) is to assess the TB treatment outcomes among targeted migrants as well as factors contributing to such outcomes. In order to achieve the purpose, this OR has the following three specific objectives.

1. To analyze the TB treatment outcomes among targeted migrants from six targeted provinces;
2. To determine key factors contributing to the treatment outcomes, both success and poor outcomes, as well as challenges encountered by the Project; and
3. To provide constructive recommendations for improving future programming.

METHODOLOGY

The research methodology included both quantitative and qualitative data collection and analysis of both primary and secondary data. The quantitative method is mainly to analyze the secondary data related to TB case notification and treatment outcomes from all six targeted provinces. Determination of key factors contributing to the treatment success and barriers to the success is qualitative in nature. It was conducted through a primary data collection from interviews and discussions with relevant informants from both service provider and the client sides. In addition to the factors related to the migrant patients and the service providers, this study also took into account the social and environmental factors that might have posed significant affect to the treatment outcomes. Please refer to the research protocol in Annex I for more details on the research design.

As the targeted migrants were from different ethnic groups with various local languages, most of the interviews with migrants had to be conducted through interpreters, while a few interviews could be conducted in Thai by the researcher without the need for an interpreter. To maintain the research quality, experienced interpreters were carefully selected. They were also briefed by the researcher on key principles of interpretation and things to avoid while interpreting. The research was able to recruit translators who are native speakers of all required migrant languages, i.e. Burmese, Mon, Kayin, and Dawai, and therefore, each interview only required one interpreter from one of the migrant languages into either Thai or English.

Research Tools

Together with the research protocol, the research tools were developed and shared with WVFT and a technical staff from the National TB Program for their review and inputs. Four types of the interview/discussion guides were developed for former patients who already completed their treatment or cured from TB, current patients, Directly Observed Treatment (DOT) Partners[1], and other health service providers (please see Annex II-VI for the research tools).

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[1] DOT Partners are individuals who regularly visit the TB patients to directly observe TB drug taking. In the TB-RAM Project, DOT Partners consist of migrant health volunteers recruited and trained by the IPs, family members, friends, and/or neighbors of TB patients who provide DOT to the patients as deemed appropriate and as agreed between the patients and the health service providers.

Study Sites Selection

Due to the time and budget constraints, the field data collection to determine key factors for the treatment outcomes were conducted in two selected districts in two targeted provinces. These are Sangkhlaburi Districts of Kanchanaburi Province and Muang District in Ranong Province. The two Districts were selected based on their relatively low and high treatment success rates and large numbers of migrant TB patients receiving the services from the Project, ensuring the feasibility of the field data collection with migrant patients. The project activities in the two selected districts have been implemented by different project partners. Initially, the filed data collection was also planned for Sai Yoke District in Kanchanaburi as a control site since the area is currently not the project's targeted site and there is no community intervention addressing the migrant health needs at the moment. However, due to the limited migrant community network, it was impossible to recruit any migrant patient for this study, and therefore, the data collection in Sai Yoke District had to be canceled.

Respondents Selection

Respondents for the qualitative primary data collection can be divided into two main groups: the migrant patients themselves and the service providers from both government and non-government partners of the Project. Both were selected through a purposive sampling.

For migrant patients, priority was given to the patients who have already completed the TB treatment to ensure that they have some experience during the treatment to share. To avoid recall bias, only those who completed the treatment within the past 12 months were recruited. Attempts were made to recruit former migrant TB patients with a history of default and/or treatment failure to compare their previous treatment experience. However, due to the mobile nature of migrant population, it was not possible to recruit defaulted patients for this study. Some patients who were still on treatment were also interviewed. Taking into consideration an ethical issue, only migrant patients aged 15 years old and above were recruited and were requested to provide a written and/or oral consent for their participation to this study. Please see more details on characteristics of the migrant respondents in the Key Findings section below.

Two group discussions with five to six members were conducted among DOT Supervisors[2] of non-government IPs – i.e. ARC, KRCH and WVFT – in both selected sites. Seven interviews and one group discussion with six DOT Partners from ARC and WVFT were also conducted in both sites to determine their level of TB knowledge and their experience as DOT Partners. In addition, two staff at the Secondary Service Delivery Points (SSDPs) at Ranong Office of WVFT were also interviewed.

For the government partners, five staff from Sangkhlaburi District and Ranong Provincial Hospitals who are responsible for the TB care were interviewed for their insights on providing TB diagnosis and treatment to migrant patients. A few courtesy visits to the local health authorities – i.e. the provincial and district public health officer – and to the local government health facilities were also conducted during the field data collection.

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[2] DOT Supervisors are fulltime staff of the IPs, i.e. Migrant Liaison Officers (MLOSs) for ARC and Frontline Social Networkers (FSNs) for WVFT, who provide DOT supervision to migrant volunteers and other types of DOT Partners.

Research Period

The duration of this OR was about nine weeks, between July 26 and 30 September 2011, inclusive of the time for desk review of relevant documents from WVFT and other sources, research protocol and tools development, field data collection, data analysis, and report writing. The field data collection was conducted from August 22-30, 2011 in Sangkhlaburi District in Kanchanaburi Province and from September 4-10, 2011 in Muang District of Ranong Province.

Data Analysis and Verification

Secondary data related to the treatment outcomes in six targeted provinces from the project's record was analyzed in an Excel spreadsheet according to the case definitions in the project's standard operating procedures manual as well as the project's monitoring and evaluation plan.

Qualitative data collected from interviews and group discussions was analyzed using the grounded theory and was triangulated with data obtained from other qualitative methods to ensure the accuracy, reliability, and to the most possible extent the causal relationship between the project's strategies and/or modalities of the services and the treatment outcomes. Preliminary findings from the treatment outcome and the interview data analysis were presented to representatives of the IPs from all six targeted provinces at the quarterly IPs' meeting in Bangkok on 16 September 2011. The treatment and interview data were verified and/or clarified and additional inputs on the local contexts were obtained. Inputs from the IPs were added to the analysis and incorporated into this report.

LIMITATIONS

The most significant challenges in conducting this OR were: 1) the lack of baseline data on migrant treatment outcomes, 2) time and budget constraints, and 3) the retrospective nature of this research. The lack of baseline data on treatment outcomes makes it difficult to analyze the project's achievements as compared to the situation prior to the project launch. However, the project life is long enough to draw trends from the past three to four years of implementation. As mentioned in the study site selection section above, the time and travel budget constraints limited the scope of qualitative data collection in relation to factors contributing to the treatment outcomes to only two out of 14 targeted districts. The retrospective approach of this OR may affect some recall bias among former migrant TB patients. To overcome these challenges, attempts were made to recruit migrants who completed the treatment within the past 12 months and to provide opportunities for the field staff from all targeted sites to review and provide additional inputs into the preliminary findings of this research.

Some minor challenges are the duration of the field data collection and the language issues. Since the field data collection was conducted in the middle of the monsoon season, it was difficult to access some of the migrant communities within the tight schedule, and therefore, the respondents were mainly selected from the easier to reach communities. However, the migrant patient respondents were recruited from various locations, in various employment sectors, and in different sub-districts to ensure that they could best represent their peers in harder-to-reach communities.

KEY FINDINGS AND DISCUSSIONS

Although there were some limitations and challenges in conducting this research as mentioned earlier, some important findings could be determined as follows, based mainly on the data obtained from the TB-RAM Project Record and the interviews/discussions with migrants in two targeted districts as well as with both government and non-government service providers from all targeted provinces.

Data and Information Obtained

Officially launched in October 2007, the Project has been implemented for almost four years at the time this research was conducted. The treatment data analyzed and included in this report came from the project's implementation records from both government and non-government partners, unless other sources are cited. However, since some clinical data are reported annually, some clinical data are only available for the analysis up until the end of Year III according to the TB cohort report (September 2010).

In addition to the clinical data, some qualitative information was also made available for the research analysis through interviews and discussions with various stakeholders. Altogether, five government health care providers were interviewed including nurses, family and community medicine specialists, and a lab technician. Twenty-six health care providers and volunteers from all three IPs were interviewed individually and in groups, most of them are DOT Partners and DOT Supervisors. Two health posts, one in each selected district of this research, were also visited during the field data collection. Moreover, individual interviews with 24 migrants were also conducted; including 22 former and current TB patients and two family members of the patients. Characteristics of the 22 former and current migrant TB patients interviewed are as laid out in Table 1 below.

Half of the 22 migrant patients recruited were former and another half were current patient, while half were in Sangkhlaburi and another half in Muang Ranong. There were 12 males and 10 females aged between 21 and 78 years old, with an average age of 43.64 years old. Almost half of them (9/22) are of Burmese ethnic, about one-third (7/22) are Mon, three are Kayin, and three are Dawai, but their places of origin vary widely. Thanintharyi Division was reported to be the place where many interviewed patients originated (6), followed by Mon (5), Bago, Yangon and Ayeyarwady (2 from each location), and Kayin and Shan (1 from each location). As compared to Muang Ranong where most of the interviewed migrants are from Thanintharyi, Sangkhlaburi tended to host migrants from more diverse ethnics. Three patients claimed that Kanchanaburi Province was their birth place; two held a "colored identification (ID) card"[3] and one had a Thai nationality. Excluding the one monk patient who lived in a temple in Myanmar side and crossed the border to receive TB treatment in Sangkhlaburi, only one-third (7/21) of them had the migrant labor work permit at the time of interviews while almost one-third were holding the colored ID card (6/21), and about one quarter (5/21) had no residential and/or work permit issued by the Royal Thai Government (RTG) although they have been in Thailand for almost two decades on average (ranged from 4-50 years) and have been at the interviewed site for about 12.5 years on average (ranged from 1-30). They claimed that the registration fee and associated costs are too high for them. In terms of family situation, majority of them (14/22) were married and were living with their

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[3] The ID card issued by the Royal Thai Government to ethnic populations who are in the process of the Thai nationality verification.

families, including two of them who married to a Thai, while three were single, and four were divorced, separated, or widows. They lived in a household of about three members on average (Range=1-7, Mode=3, Median=5), with an average of THB 6,650/month[4] for the household income (ranged between zero and 20,000) and this was reported to be far better than their level of income in Myanmar. A few families interviewed earned more than THB 10,000/month[5]; which is bit higher amount than a newly university graduate employed in the government sector in Thailand. Agricultural works (5) and seafood processing (4) were the most frequent occupations among them but these could be due to the nature of the sites visited for this OR; followed by general labor and craftwork (two each); and factory, fishing and domestic works (one each). There were also two monks, one housewife, and three unemployed migrants interviewed.

While half of them had some primary education, about one-third (7/22) of them had never attended formal education, whereas four of them used to attend secondary school with a total of 8-10 years of formal education. Despite this, only four of them cannot read and write any language, while majority of them (15/22) can read difficult Myanmar text. Majority of them (14/22) could not master Thai language skills and could not speak Thai at all, despite the long migration period into Thailand. Some (6) could communicate freely with daily conversation. Only two of them could read simple or difficult Thai text.

Table 1. Characteristics of Interviewed Migrant Patients

Characteristic	Finding
Current Residence	Sangkhlaburi = 11, Muang Ranong = 11
TB Status	Former patient = 11, Current patient = 11
Sex	Male = 12, Female = 10
Age	Average = 43.64 years old (Range =21-78)
Ethnicity	Burmese = 9, Mon = 7, Kayin = 3, Dawai = 3
Place of Origin	Thanintharyi = 6, Mon = 5, Kanchanaburi =3, Bago = 2, Yangon = 2, Ayeyarwady = 2, Kayin = 1, Shan = 1
Length of Stay in Thailand	Average = 19.02 years (Range = 4-50)
Length of Stay at Interviewed Site	Average = 12.5 years (Range = 1-30)
Residential Permit	Migrant work permit = 7, Colored ID** = 6, Alien registration = 1, Household registration = 1, Thai national ID = 1, None = 6 (1 lives in Myanmar)
Marital Status	Single = 3, Married = 14 (2 married to a Thai), Divorced / Separated = 2, Widows = 2
Number of Family Members at Interviewed Site	Average = 3 (Range = 1-7), Mode =3, Median = 5
Occupation	Agricultural workers = 5, Seafood processing = 4, General laborer = 2, Craftsman = 2, Monk = 2, Factory worker = 1, Seafarer = 1, Domestic worker = 1, Housewife = 1, Unemployed = 3

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[4] Approximately USD 220/month.
[5] Approximately USD 333/month.

Characteristic	Finding
Household Income	Average = THB 6,650 (Range = 0-20,000)
Education	Average = 4 years (Range = 0-10), Mode = 0, Median = 3.5
Literacy Level*	Illiterate = 4, Can read simple text = 3, Can read difficult text = 15
Thai Language Proficiency	None = 14, Daily conversation = 6, Can read simple text =1, Can read difficult text =1
Health Insurance	Migrant Health Insurance = 8, Universal Coverage Scheme = 4, None =10 (1 live in Myanmar)

Note: * In native language
Source: Field data collection

Case Notification

As shown in Table 2 below, during the past three years and nine months between October 2007 and June 2011, the Project screened 17,246 TB suspected migrants in all 14 targeted districts. The number of migrants screened during Year I of project implementation was less than 1,200 but the number was sharply increased in Year II when the number was more than three times higher than that of Year I. In Year III, the Project further increased the number of suspected cases screened to almost double of the number of individuals screened in Year II, or almost six times higher than that of Year I. Although the data from the last quarter of Year IV was not yet available, the trends from the past three quarters suggested that the number of migrants screened for TB infection in this year would be at similar level to the past year. These trends were also generally found at the district level including the two districts visited for this research (Table 2.1). This situation is not only because of the nature of the Project, but also seen in other donor funded projects where the implementation teams need some time during the first year to establish themselves and gain trust from the targeted communities as well as to fine-tune modalities for implementation with relevant partners. Another key factor contributing to the rapid increase in terms of the numbers of migrants screened for TB is the national policy to combat TB in Thailand, in which migrant is one of the key targeted populations. Since the end of 2008, the Ministry of Public Health of the RTG has launched a large scale campaign for active TB case finding among migrants in various migrant-populated areas, including many areas covered by the TB-RAM Project.   The project implementation teams in such areas have been working in close collaboration with the local health authorities and facilities and most, if not all, of the migrant TB cases have been supported by and recorded under this Project. In some targeted districts, the Medicins Sans Frontieres (MSF), which is an international non-governmental organization (NGO) who has been providing TB treatment to migrants in communities for a long time, closed down its program and therefore some patients were transferred to the TB-RAM Project; new patients who might have been detected by the MSF became detected by the Project. In addition, 2008-2009 timeframe was also the time that the RTG and the Myanmar Government started to operationalize the bilateral agreement on migration management which required Myanmar migrants to register and obtain official visa and work permit and medical checkup was also required; thus, a sharp increase of the number of migrants screened for TB infection.

Among the suspected cases screened in the past four years, approximately 9% (1,563/17,246) were diagnosed as TB cases. It is important to note that while the numbers of migrants screened have increased over the years, proportions of TB cases identified have slightly decreased from about 14% in Year I to about 13% in Year II, and significantly dropped to about 7% in Year III and IV. This is probably because the Project could identify more

obvious cases in the first year before the massive case finding campaign was launched, and migrants with mild or no signs and symptoms were also screened since the second year. In addition, since Year III of the project implementation, the inclusion criteria for case notification was amended to include a much broader scope of household contacts of the patients (i.e. from only household members to include also co-workers and others) as well as the suspected cases and/or patients referred from the health facilities that were not included in the case detection record in Year I and II. However, proportions of new cases and retreatment cases detected by the Project to date seemed to be consistent at about 93-95% (93.73% average) for new cases and 5-7% (6.27% average) for retreatment cases. An average proportion of new and relapse cases in the past almost four years was reported at 96.03% (1,501/1563), with the range from 95.1% to 96.93%. As compared to the national TB prevalence reported among the Thai population in 2009, the proportions of new cases (94.04%; 62,011/65,940), retreatment cases (5.96%; 3,929/65,940), and the new and relapsed cases combined (97.02%; 63,975/65,940) were similar to those found among migrants reported from the Project (Table 2). Similar variances were also found when comparing the data from the same year period as the proportions of new cases, retreatment cases, and the new and relapsed cases combined among migrants in the fiscal year 2009 were 94.65%, 5.35%, and 95.99%, respectively.

Although the data on estimates of TB burden, i.e. mortality and morbidity rates, among migrants is not available, the case notification data suggests that the level of TB problem among migrants may be similar to that of the Thai population but the type of problem could be different according to the differences in detailed breakdowns of new and retreatment cases found among Thai and migrant populations. The Table 2 shows that case notification rates (CNRs) for new sputum smear-positive cases among migrants were relatively consistent over the implementation years, and the rates were about 10% higher than that of the Thai population (63-64% vs. 53%). On the other hand, although the new sputum smear-negative rates among migrants were fluctuated over the years (about 25-32%), the total rate was only about 3% lower than the rate among Thai population (29.15% vs. 32.35%). Another difference could be observed among the extrapulmonary TB cases. The extrapulmonary TB case rates among migrants in the targeted areas also fluctuated (between 3% and 8%), whereas the total CNR was about one-third of the Thai population (5.53% vs. 14.74%). Again, similar variances were found when comparing the data from the same year period as the proportions of new smear-positive cases, smear-negative cases, and extrapulmonary TB among migrants in the fiscal year 2009 were at 63.84%, 29.7%, and 5.46%, respectively. The data in Table 2 also raises a concern on the smear unknown status among migrant TB patients. While the number of new cases notified among Thai population in 2009 was more than 42 times higher than the number of migrant population notified as new TB cases over the four years of project implementation (62,011 vs. 1,465 cases), there was no smear unknown case reported among the Thai population while there were 25 cases reported among migrants; of whom 10 were reported from Mae Sot District of Tak Province in Year IV alone. This suggests for a further investigation to ensure that the different phenomena found among Thai and migrant populations were not due to malpractice or unstandardized quality of service.

Among the retreatment cases, slightly more than one-third (36.73%) of the migrant patients notified were relapsed cases and about another one-third (32.65%) were treatment after failure cases. The rate of migrant cases who were notified after default was very small (5.1%), while the retreatment cases due to other factors accounted for about one quarter (25.51%) of all retreatment cases notified. In the fiscal year 2009 alone, the overall

retreatment case rate among targeted migrants was reported at 5.35% of all TB cases notified in the same year. The treatment after default rate remained the lowest (7%) among the retreatment group. While the relapsed and treatment after failure cases shared similar proportions (25% and 29%), retreatment due to other factors was reported to have the highest share among the retreatment group (39%). Comparing to the Thailand data in 2009, relapse and treatment after default tended to be bigger problems among Thais than migrants (49.99% vs. 25% and 18.48% vs. 7%). The same patterns were also observed when comparing the Thai data in 2009 and average data among migrants (49.99% vs. 36.73% and 18.48% vs. 5.1%). On the other hand, the reported treatment after failure and other retreatment case rates among migrants was about double that among the Thai population. The treatment after failure and other retreatment case rates among the Thai population in 2009 were report at 14.63% and 16.9%, whereas the rates among migrants in 2009 were 29% and 39%, with the total rates from the past 45 months were at 32.65% and 25.51%. This suggests that drug resistance could be a bigger concern among migrants.

Table 2. Number of Migrant TB Patients Notified by Case Category and by Fiscal Year from October 2007 - June 2011, and Thailand Data in 2009

Case Category	Year I: Oct. 2007-Sept. 2008 (%)	Year II: Oct. 2008-Sept. 2009 (%)	Year III: Oct. 2009-Sept. 2010 (%)**	Year IV: Oct. 2010-Jun. 2011 (%)**	Total	Thailand Data 2009 (%)
Suspected Cases Screened*	1,172	3,880	6,998	5,196	**17,246**	Not Available
All TB Cases Notified	163 (13.91)	489 (12.60)	523 (7.47)	388 (7.47)	**1,563 (9.06)**	65,940
Total New and Retreatment Cases	*158 (96.93)*	*472 (96.52)*	*502 (95.99)*	*369 (95.1)*	*1,501 (96.03)*	*63,975 (97.02)*
Total New Cases	*151 (92.64)*	*460 (94.1)*	*495 (94.65)*	*359 (92.5)*	*1,465 (93.73)*	*62,011 (94.04)*
New Smear-positive	97 (64.24)	292 (63.48)	316 (63.84)	227 (63.23)	**932 (63.62)**	32,810 (52.91)
New Smear-negative	43 (28.48)	149 (32.39)	147 (29.7)	88 (24.52)	**427 (29.15)**	20,058 (32.35)
Smear Unknown	1 (0.66)	4 (0.87)	5 (1.01)	15 (4.18)	**25 (1.71)**	0
Extrapulmonary TB	10 (6.62)	15 (3.26)	27 (5.46)	29 (8.08)	**81 (5.53)**	9,143 (14.74)
Total Retreatment Cases	*12 (7.36)*	*29 (5.93)*	*28 (5.35)*	*29 (7.47)*	*98 (6.27)*	*3,929 (5.96)*
Relapse	7 (58.33)	12 (41.38)	7 (25.0)	10 (34.48)	**36 (36.73)**	1,964 (49.99)
Treatment after failure	4 (33.33)	7 (24.14)	8 (29.0)	13 (44.83)	**32 (32.65)**	575 (14.63)
Treatment after default	0	2 (6.9)	2 (7.0)	1 (3.45)	**5 (5.1)**	726 (18.48)
Others	1 (8.33)	8 (27.59)	11 (39.0)	5 (17.24)	**25 (25.51)**	664 (16.90)

Sources: 1) TB-RAM Project Record, as of June 2011
2) http//:www.who.int/tb/data. World Health Organization. *Tuberculosis Profile – Thailand*, 2009.

Note: * Screening criteria changed from Year III
** Include also data from KRCH that participated to the Project from Year III

Table 2.1 Number of Migrant TB Patients Notified by Case Category and Fiscal Year in Sangkhlaburi and Muang Ranong Districts, October 2007 - June 2011

District	Imp. Period	No. of Cases Screened (%)	No. of Cases Notified (%)	New cases					Retreatment cases					No. of Cases Enrolled **
				Smear + (%)	Smear - (%)	Smear U/K (%)	Extra-pul-mona-ry (%)	Total (%)	Re-lapsed (%)	TAF (%)	TAD (%)	Other (%)	Total (%)	
Sang-khlaburi	Year I	154	13 (8.44)	7 (53.85)	4 (30.77)	0	2 (15.38)	13 (100.0)	0	0	0	0	0	13
	Year II	487	64 (13.14)	32 (50.79)	27 (42.86)	0	4 (6.35)	63 (98.40)	0	0	1 (100.0)	0	1 (1.56)	64
	Year III*	1,350	124 (9.19)	68 (56.20)	34 (28.10)	4 (3.31)	15 (12.40)	121 (97.60)	0	0	1 (33.33)	2 (66.67)	3 (2.42)	123
	Year IV*	870	106 (12.18)	67 (65.05)	21 (20.39)	1 (0.97)	14 (13.59)	103 (97.20)	1 (33.33)	0	0	2 (66.67)	3 (2.83)	79
Total Sangkhaburi		2,861	307 (10.73)	174 (58.0)	86 (28.67)	5 (1.67)	35 (11.67)	300 (97.7)	1 (14.29)	0	2 (28.57)	4 (57.14)	7 (2.28)	279
Muang Ranong	Year I	214	39 (18.22)	25 (67.57)	5 (13.51)	0	7 (18.92)	37 (9.49)	1 (50.0)	1 (50.0)	0	0	2 (5.13)	39
	Year II	527	109 (20.68)	80 (80.81)	13 (13.13)	2 (2.02)	4 (4.04)	99 (8.61)	1 (10.0)	5 (50.0)	0	4 (40.0)	10 (8.70)	115
	Year III*	1,303	94 (7.21)	53 (60.23)	32 (36.36)	0	3 (3.41)	88 (8.54)	1 (16.67)	4 (66.67)	1 (16.67)	0	6 (5.83)	103
	Year IV*	799	66 (8.26)	39 (67.24)	12 (20.69)	0	7 (12.07)	58 (8.79)	2 (25.0)	5 (62.50)	0	1 (12.50)	8 (12.12)	66
Total Muang Ranong		2,843	308 (10.83)	197 (69.86)	62 (21.99)	2 (7.09)	21 (7.45)	282 (8.73)	5 (19.23)	15 (57.69)	1 (3.85)	5 (19.23)	26 (8.05)	323

Source: TB-RAM Project Record, as of June 2011

Note: Screening criteria changed from Year III
* Include also data from KRCH that participated to the Project from Year III
** Number of enrolled cases also includes transferred-in and less transferred-out patients, therefor, the numbers of cases enrolled may differ from the numbers of cases notified.

Among the 1,563 migrant TB cases notified as of June 2011, majority of them (93.73%) were newly diagnosed patients as shown in Table 3 below. According to the reported migrant TB cases, the six targeted provinces can be divided into two groups. Tak, Ranong and Kanchanaburi are the border provinces that have many official and natural border crossing points between Thailand and Myanmar and are well known as migrant-populated provinces in Thailand. This "Tier I" group of border provinces reported about three to four time higher percentages of migrant TB cases than the "Tier II" group; Chumphon, Phuket, and Phang Nga (23-25% vs. 7-10% of all cases notified). Chumphon does not have a border adjacent to Myanmar and the job opportunities may not be as large as in other urban and/or border provinces. Although Phang Nga and Phuket are the coastal provinces with extensive sea border, it is difficult for migrants to directly migrate to these provinces due to the geographical difficulties, and therefore, migrants usually have to cross the border into Thailand from other entry points, mainly the three provinces in the "Tier I" group and further migrate into the "Tier II" provinces. The less concentration of migrants in the "Tier II" provinces may result in less number of reported migrant TB patients. The targeted migrant population size reported by the IPs in different provinces also reflects the possibility for grouping the targeted provinces into two tiers (Table 4). However, the proportion of new cases reported from all six provinces was higher than 90% of all cases notified; with the range from about 91% in Chumporn and Tak to 98% in Kanchanaburi.

Table 3. Number of Migrant TB Cases Notified by Type of Diagnosis and Province, October 2007 - June 2011

Province	New Cases					Retreatment Cases					Total
	Smear Positive (%)	Smear Negative (%)	Smear Unknown (%)	Extra-pulmonary TB (%)	Sub-total	Relapse (%)	TAF * (%)	TAD * (%)	Others (%)	Sub-total	
Tak	259 (68.52)	100 (26.46)	11 (2.91)	8 (2.12)	*378 (91.08)*	20 (54.05)	9 (24.32)	1 (2.7)	7 (18.92)	*37 (8.92)*	*415 (22.55)*
Ranong	249 (68.98)	89 (24.65)	2 (0.55)	21 (5.82)	*361 (93.28)*	5 (19.23)	15 (57.69)	1 (3.85)	5 (19.23)	*26 (6.72)*	*387 (24.76)*
Kanchana-buri	218 (59.08)	115 (31.17)	7 (1.90)	29 (7.86)	*369 (97.88)*	3 (37.5)	2 (25.0)	1 (12.5)	2 (25.0)	*8 (2.12)*	*377 (24.12)*
Chumporn	63 (44.37)	67 (47.18)	3 (2.11)	9 (6.34)	*142 (91.03)*	3 (21.43)	4 (28.57)	0	7 (50.0)	*14 (8.97)*	*156 (9.98)*
Phuket	83 (72.17)	23 (20.0)	0	9 (7.83)	*115 (95.83)*	1 (20.0)	2 (40.0)	1 (20.0)	1 (20.0)	*5 (4.17)*	*120 (7.68)*
Phang Nga	60 (60.0)	33 (33.0)	2 (2.0)	5 (5.0)	*100 (92.59)*	4 (50.0)	0	1 (12.5)	3 (37.5)	*8 (7.41)*	*108 (6.91)*
Total	**932 (63.62)**	**427 (29.15)**	**25 (1.71)**	**81 (5.53)**	**1,465 (93.73)**	**36 (36.73)**	**32 (32.65)**	**5 (5.1)**	**25 (25.51)**	**98 (6.27)**	**1,563**

Source: TB-RAM Project Record, as of June 2011
Note: * TAF = Treatment after failure, TAD = Treatment after default

Table 4. Estimated Number of Registered and Unregistered Migrant Population in the Targeted Areas by Province in 2009

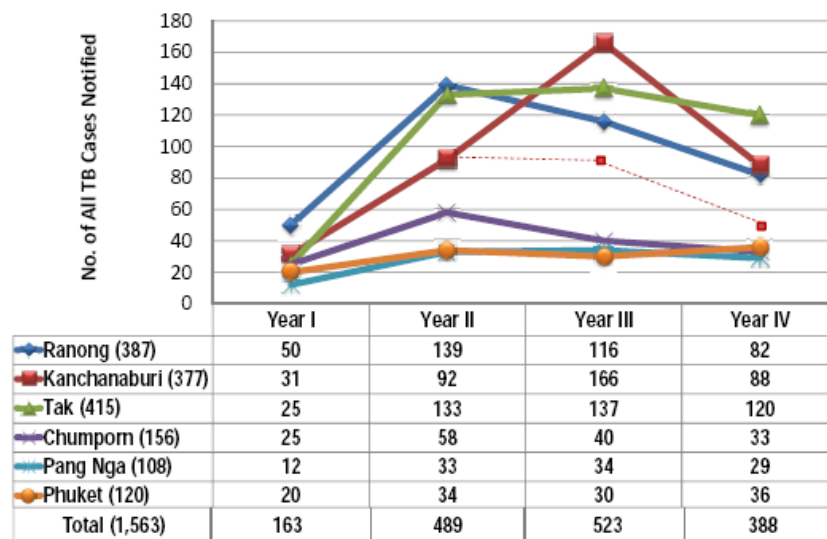| Province	Estimated Migrant Population (%)
Tak (1 district)	85,307 (36.24)
Kanchanaburi (2 districts)	65,240 (27.72)
Ranong (2 districts)	29,805 (12.66)
Phang Nga (4 districts)	23,982 (10.19)
Chumporn (3 districts)	23,588 (10.02)
Phuket (2 districts)	7,472 (3.17)
Total (14 districts)	**235,394 (100%)**

The Table 3 also shows the unique characteristics of migrant patients in different targeted provinces. Among new cases, Chumporn reported almost equal rates for smear-positive (44%) and smear-negative (47%) cases (ratio=1:1), while all other provinces reported that the smear-positive rates were about two to three times higher than the smear-negative rates (ratio=2-3:1). Between 2-3% of the new cases notified in all provinces reported unknown sputum smear status, except for Ranong where the rate was only 0.55% and there was no smear unknown case reported in Phuket. Extrapulmonary TB rates stood similar level between 5% and 8% in all provinces, except Tak where the rate was much lower (2%). For retreatment cases, Phang Nga and Tak Provinces reported much higher levels of retreatment cases due to relapse with the rates of 50% and 54%. Treatment after failure cases were reported at relatively high level (24-58%) in all provinces, with the highest rates in Ranong (58%) and Phuket (40%), but there has been no report so far on such a case from Phang Nga Province. While the overall proportion of retreated patients after default was not big (5.1%), the cases seemed to be found more in Phuket (20%), Phang Nga (12.5%) and Kanchanaburi (12.5%). The retreatment cases due to other factors also shared relatively high proportion in

most of the provinces, from 50% in Chumporn, 38% in Phang Nga, 25% in Kanchanaburi, 20% in Phuket, and 19% in Ranong and Tak.

Considering the migrant TB cases notified by implementation years, overall trends over the years show again the difference in term of absolute numbers in the "Tier I" and the "Tier II" provinces. Although some provinces reported less numbers of new migrant TB cases in Year III, the overall number of the reported cases from all sites has still slightly increased. While the last quarter of Year IV data was not available at the time of this research, the cumulative reported numbers of new TB cases during the three quarters in Year IV suggested that the total number of reported cases in this year should remain at similar level as that of Year III (Figure 2).

As shown in Figure 2 below, all targeted provinces reported similar trends in relation to the numbers of cases notified. The numbers of reported cases were very small in the Year I, and sharply increased from about two-fold to more than five-fold in the Year II in most of the provinces except Phuket, and remained at almost the same levels for Year III in most of the targeted provinces. Exceptions were found in Ranong Province where the number of cases notified in Year III has visibly decreased, but still about two times higher than that of the first year, while the number in Kanchanaburi Province has continued to increase sharply, mainly because one additional IP (KRCH) joined the Project in Year III. Although the data from the last quarter of Year IV was not available, the trends from the last three quarters suggested that the number of cases to be notified in this year should stand at similar levels of Year III with two exceptions. The number of cases identified in Phuket from the past three quarters has already exceeded those of Year II and III, but the number in Kanchanaburi has dropped by half of that of Year III. These could be explained by the factors mentioned earlier on the time required for the project establishment in the first year and the national campaign on TB case finding. The decreased number of notified cases in Year IV in Kanchanaburi was reported to be due to the emphasis put on active case findings by both government and non-government sectors in Year II where a large number of TB cases were already identified, resulting in the difficulty in identifying more new cases in this area.

Figure 2. Number of Migrant TB Cases Notified by Fiscal Year and Targeted Province, October 2007 - June 2011

	Year I	Year II	Year III	Year IV
Ranong (387)	50	139	116	82
Kanchanaburi (377)	31	92	166	88
Tak (415)	25	133	137	120
Chumporn (156)	25	58	40	33
Pang Nga (108)	12	33	34	29
Phuket (120)	20	34	30	36
Total (1,563)	163	489	523	388

Note: ---------- Without KRCH
Source: TB-RAM Project Record, as of September 2011

Due to different methodologies used to numerate and to estimate the numbers of migrant populations by different IPs and locations, the CNR per 100,000 populations calculated for this analysis should be interpreted with caution. Since the target migrant population sizes in Year I and Year II were roughly estimated, the data reported in Year III were used to calculate CNRs as shown in Table 6 below, assuming that the population sizes were relatively stable in the past three to four years and the size of migrant population in Year III was more reliable due to the improved methodologies for mapping by the IPs. Accordingly, the data suggested that the overall CNR of all TB cases should be about 207/100,000 populations or higher, while the CNR for new sputum smear-positive cases should be about 124/100,000 populations or higher, based on the data from Year II and III when the Project was fully implemented. The overall CNR of all TB cases reported from this Project was similar to the result from the National TB Prevalence Survey conducted by the National TB Program in Myanmar in 2009-2010 where the prevalence of 242/100,000 populations was reported (Table 5).[6] However, the CNR for new sputum smear-positive cases in Myanmar in 2009 (81/100,000) seemed to be much lower than those reported by the Project (124-134/100,000) during the same time period (Table 6).

Table 5. Case Notification Rates of All TB and New Sputum Smear-positive Cases at the National Level and in Mon State and Thanintharyi Division of Myanmar in 2009

Type of Population	National	Mon State	Thanintharyi Division
Prevalence	242/100,000	Not available	Not available
CNR of All TB Cases	63/100,000	317/100,000	370/100,000
CNR of New Smear-positive Cases	81/100,000	86/100,000	54/100,000

Source: National TB Prevalence Survey: Annual Report 2009. National TB Program, Myanmar

The same survey in Myanmar also reported the CNRs of 86/100,000 populations for new sputum smear-positive cases and 317/100,000 populations for all TB cases in Mon State. Comparing to these figures, the Project in Kanchanaburi – the province that shares a land border with Mon State in Myanmar where majority of migrants in Kanchanaburi originate – reported similar CNR for new sputum smear-positive cases in Year II (72/100,000 vs. 86/100,000) but the CNR in Year III was almost double that of Mon State (153/100,000 vs. 86/100,000). However, the CNR of 317/100,000 populations for all TB cases reported in Mon State was much higher than those of Kanchanaburi (141-254/100,000 in Year II and III).

Opposite to the situations in Kanchanaburi and Mon State, the CNR for new sputum smear-positive cases in Tanintharyi Division of Myanmar that has both land and sea borders with Ranong Province of Thailand reported much lower rate than those of Ranong (54/100,000 vs. 218 and 342/100,000 in Year II and III). On the other hand, the CNR for all TB cases reported in Tanintharyi Division (370/100,000) was similar to that of Ranong in Year II (389/100,000) but much lower that Ranong's rate in Year III (466/100,000).

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[6] National TB Program, Myanmar (2009).

**Table 6. Numbers and Case Notification Rates of All TB Cases and
New Sputum Smear-positive Cases in All Targeted Sites,
Kanchanaburi, and Ranong, October 2007 - September 2010**

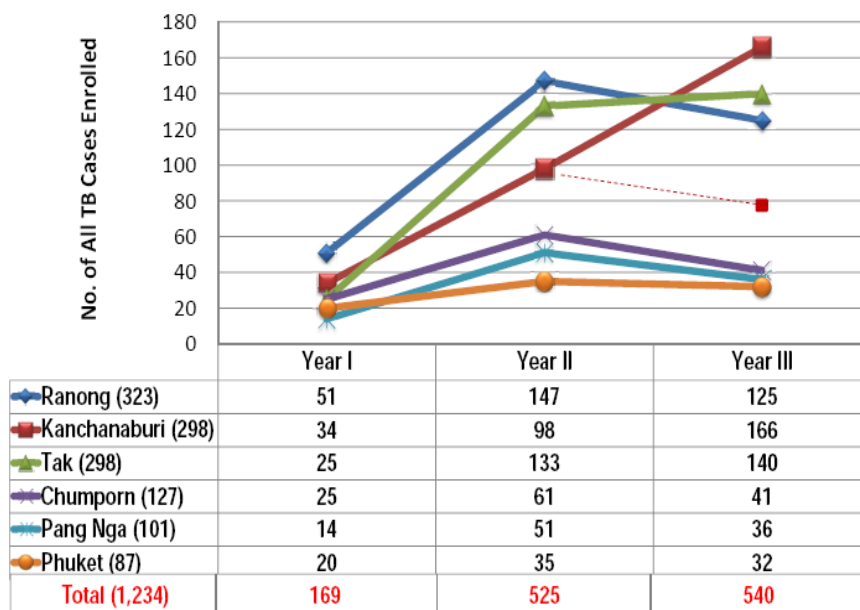| Location	Type of Population	Year I: Oct. 2007-Sept. 2008	Year II: Oct. 2008-Sept. 2009	Year III: Oct. 2009-Sept. 2010
All 14 Targeted Districts	Estimated Number of Migrant Population	235,394*	235,394*	235,394
	All TB Cases Notified	163	489	523
	CNR of All TB Cases	69/100,000	207/100,000	222/100,000
	New Smear-positive Cases Notified	97	292	316
	CNR of New Smear-positive Cases	41/100,000	124/100,000	134/100,000
Kanchanaburi (Sangkhlaburi and Thongphaphoom Districts)	Estimated Number of Migrants	65,240*	65,240*	65,240
	All TB Cases Notified	31	92	166
	CNR of All TB Cases	48/100,000	141/100,000	254/100,000
	New Smear-positive Cases Notified	18	47	100
	CNR of New Smear-positive Cases	28/100,000	72/100,000	153/100,000
Ranong (Muang and Kraburi Districts)	Estimated Number of Migrant Population	29,805*	29,805*	29,805
	All TB Cases Notified	50	139	116
	CNR of All TB Cases	168/100,000	466/100,000	389/100,000
	New Smear-positive Cases Notified	31	102	65
	CNR of New Smear-positive Cases	104/100,000	342/100,000	218/100,000

Source: TB-RAM Project Record, as of September 2011
Note: * Estimates of migrant population sizes from Year III

Case Enrollment

As of September 2010, the Project has provided TB treatment and support services to 1,234 migrant TB patients in all six targeted provinces. The numbers of cases enrolled in all sites had similar trends to those of the case notification. Striking data to note here is the sharp increase in number of migrant TB cases enrolled in Kanchanaburi between Year II and Year III while those of all other targeted provinces slightly decline. This is mainly because of the inclusion of new IP, i.e. KRCH, to the project implementation in Year III. Since the KRCH's approach has been focusing on facility-based service, it can contribute largely to the case enrollment but probably not much in terms of the case notification as evidenced in the Figure 2 and the treatment success (see more details in relevant section). Figure 4 suggests that, in fact, about one-third of the patients had access to the health facilities in the targeted communities who referred the patients to the Project.

Figure 3. Number of Migrant TB Cases Enrolled by Fiscal Year and Targeted Province, October 2007 - September 2010

	Year I	Year II	Year III
Ranong (323)	51	147	125
Kanchanaburi (298)	34	98	166
Tak (298)	25	133	140
Chumporn (127)	25	61	41
Pang Nga (101)	14	51	36
Phuket (87)	20	35	32
Total (1,234)	**169**	**525**	**540**

Note: ----------- Without KRCH
Source: TB-RAM Project Record, as of September 2010

Figure 4. Numbers and Proportions of Migrant TB Cases by Sources of Case Notification, October 2007 - June 2011
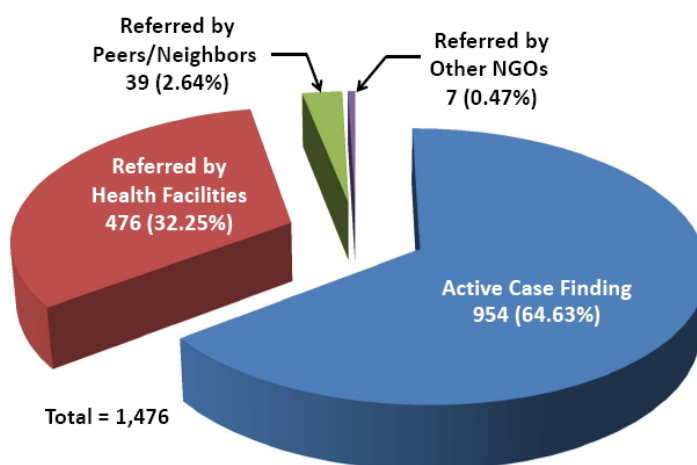
Source: TB-RAM Project Record, as of June 2011

Treatment Outcomes

By the end of Year III, the Project had supported a total of 1,234 migrant TB patients to access quality TB treatment through community- and facility-based DOTS as well as provided supplemental food and nutrition and psychosocial supports to the patients and families as needed. Overall, the treatment success rates for both new smear-positive and all TB cases were up to standard. Average treatment success rates among all migrant TB cases

(85.82%; 950/1,107) and new sputum smear-positive cases (85.26%; 532/624) reported from all targeted provinces to date stood at similar levels (Figure 5).

Figure 5. Treatment Success Rates among All Migrant TB Cases
and New Smear-positive Cases by Province from October 2007 - June 2010

	Average	Kanchana buri	Tak	Ranong	Phuket	Pang Nga	Chumporn
▪All TB Cases	85.82	84.29	80.77	88.44	84.15	89.8	91.96
▲New Smear+	85.26	80.56	82.91	89.44	84.48	91.11	87.18
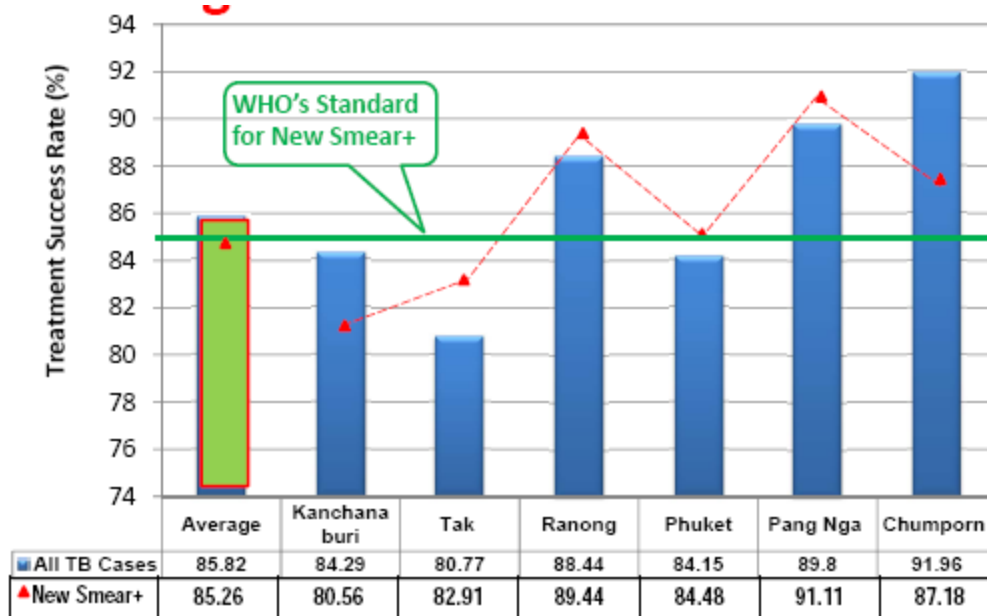
Source: TB-RAM Project Record, as of June 2010

It is unfortunate, that the Thailand data on all TB cases treatment success rate was not available for comparison; however, the treatment success rate of new smear-positive cases among migrants appeared to be higher than the rate reported among Thai population in 2009 (82%).[7] Despite of the unique challenges in providing health service to migrants, e.g. cultural and language barriers and their marginalized situation, the Project has demonstrated a great success in bringing the level of treatment success among new smear-positive migrant patients to the 85% goal indicated by the World Health Organization (WHO).[8]

There is no reliable data related to TB treatment outcomes among migrant population in Thailand, and therefore, it is difficult to consider whether the treatment outcomes have been improved. However, comparison of the data within the Project could demonstrate the current trends for migrant TB treatment success. As can be seen in Figure 6, overall, the treatment success rates were slightly fluctuated and stood between 83% and 88% in the past three years. Tak is the only province that reported continuously decrease treatment success rate from about 88.0% in Year I to 74.51% in Year III, while Phuket and Chumporn are the only provinces that reported continuously increase treatment success rates and stood at over 93% in Year III. Besides Tak, Kanchanaburi is another province that reported much lower success rate in Year III (79.85%) despite of relative high success rates in first two years. This is mainly because of very low success rate among patients under care of KRCH. As its approach is facility-based, the patients enrolled at KRCH tended to have higher default and death rates.

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[7] World Health Organization (2009).
[8] World Health Organization (1999).

Figure 6. Treatment Success Rates among All Migrant TB Cases by Year and Province from October 2007 - June 2010

	Year I	Year II	Year III
Tak	88	84.21	74.51
Kanchanaburi	85.29	89.8	79.85
Chumporn	84	93.44	96.15
Ranong	88.24	87.76	89.58
Phang Nga	85.71	92.16	87.88
Phuket	75	82.86	92.59
Average	85.21	88	83.29
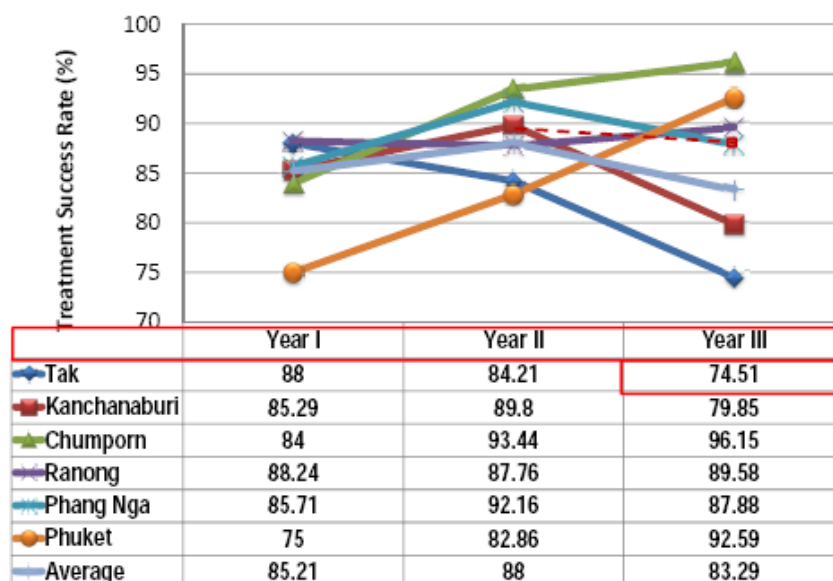
Note: Year III data only from three quarters between October 2010 - June 2010
----------- Without KRCH
Source: TB-RAM Project Record, as of June 2010

The success rates among infectious TB patients in the past three years were a bit of concern. As show in Table 7, the treatment success rates among smear-positive TB cases in the past few years fluctuated in half of the target provinces (Phang Nga, Chumporn, and Kanchanaburi) and gradually decreased in some provinces (Ranong and Tak). Phuket is the only province that reported gradual increase of success rate. However, data from the most recent implementation year indicated that two of the six targeted provinces (Tak and Kanchanaburi) reported only 77% or lower treatment success rates among migrant patients with infectious TB, which were much lower than WHO's standard.

Table 7. Treatment Success Rates among Smear-positive Patients by Year and Province from October 2007 – September 2010

Province (Average %)	Year I		Year II		Year III	
	Smear+ Cases Enrolled	Cured & Completed (%)	Smear+ Cases Enrolled	Cured & Completed (%)	Smear+ Cases Enrolled	Cured & Completed (%)
Phuket (84.48)	18	14 (77.78)	22	19 (86.36)	18	16 (88.89)
Phang Nga (91.11)	6	5 (83.33)	17	16 (94.12)	22	20 (90.91)
Ranong (89.44)	31	28 (90.32)	102	92 (90.20)	47	41 (87.23)
Chomphon (87.18)	10	7 (70.0)	21	20 (95.24)	8	7 (87.50)
Tak (82.91)	15	14 (93.33)	83	73 (87.95)	60	44 (73.33)
Kanchanaburi (80.56)	18	13 (72.22)	47	42 (89.36)	79	61 (77.22)
Total (85.26)	98	81 (82.65)	292	262 (89.73)	234	189 (81.82)

Note: Year III data only from three quarters between October 2010 - June 2010
Source: TB-RAM Project Record, as of June 2011

When analyzing the unsuccessful treatment outcomes by provinces and by implementation years, it was evident that this was mainly due to the death cases in Phuket over the years (3-10%; 4.88% on average). While Phang Nga and Kanchanaburi tended to report similar levels of default and death rates (3-4% and 7-8%, respectively), Chumporn is the only province among the targeted provinces that has always had higher default rates (3-8%; 4.46% on average) than other unsuccessful case rates (1-2 % defaulting and failure) over the years. The relatively large increased default and death rates in Phang Nga was mainly because the overall number of patients was very small; resulting in sensitive percent change although the crude number was very small. Although the death and default rates in Kanchanaburi tended to be at very similar levels over the years, the records indicated that the death rates doubled from about 5% to 10% and the default rates tripled from about 3% to 9% between Year II and Year III. Further analysis found that these were mainly because of the high volume of deaths and loss-to-follow-up among patients registered at KRCH as mentioned earlier. No contributing factor could be identified for the higher default rate than other unsuccessful outcomes in Chumporn. Despite the highest volume of caseload among all the target provinces, Ranong Province reported relatively high treatment success rates among all TB and infectious TB patients comparing to other target provinces, whereas only one defaulted case has been reported over the past three years of project implementation. This, perhaps, can be explained by long-standing presence of the IPs in Ranong, especially the WVFT that has over a decade of track record on providing health services to migrants through its own clinic, which establishes strong networks and linkages with migrant communities. Staff interviewed in Ranong for this research also tended to have well and depth understanding about TB, community approaches, and patient counseling that came from their long experiences working in the communities. Of a concern is the highest number and proportion of treatment failure cases in both Ranong and Tak Province; reflecting higher volume of drug resistant cases but this could be a result of having more retreatment cases enrolled in these provinces. Overall, Tak Province reported similar proportions of failure, death and defaulted cases (4-5%), and all these tended to slightly increase over the years (Table 8).

Among the default cases, the majority of them were male (65.9%) aged between 20 and 40 years old (65.9%). Their occupations varied widely but mainly dependent (19.5%), agricultural workers (19.5%), factory workers (17.1%), and general labors (12.2%). The information on level of income of more than half of them was not available but among the 17 known level of income, most of them (over 82%) earned THB 3,000-5,000 per month. Majority of the default cases (73.2%) received DOTS from the Project staff, either migrant volunteers or DOT Partners, whereas the remaining received DOTS from other types of DOT Partners such as families and friends. The default cases had been on the treatment for different period of time, ranged from less than one month to more than eight month. While about 12% quit the treatment within the first month, many of them continued for 2-3 months (41.5%). It is noteworthy that almost one-quarter of the cases were lost after more than 5 months of treatment. About two-third of the default cases experienced joining the patient's self-help group, but only one of them reported being discriminated by others in the community. According to the Project's DOT Partners, although anecdotal, majority of the default cases had high to moderate level of TB knowledge while about one-third had low level of TB knowledge. Also based on investigations in the patients' communities by the DOT Partners, more than half of the defaulted cases (51.2%) returned to Myanmar, 22% could not be traced and therefore the reason was unknown, 9.83% moved to other locations in Thailand, and 17.1% were loss-to-follow-up due to other reasons such as family reasons and the patient refused to take medicine.

Table 8. Treatment Outcomes among All Migrant TB Cases by Province and by Year, October 2007 - June 2011

Province	Period	Cases Enrolled	Cured & Completed (%)	Defaulted (%)	Died (%)	Failed (%)
Tak	Year I	25	22 (88.0)	0	1 (4.0)	1 (4.0)
	Year II	133	112 (84.21)	7 (5.26)	4 (3.01)	4 (3.01)
	Year III	102	76 (74.51)	7 (6.86)	7 (6.86)	6 (5.88)
	Total	*260*	*210 (80.77)*	*14 (5.38)*	*12 (4.62)*	*11 (4.23)*
Kancha-naburi	Year I	34	29 (85.29)	2 (5.88)	2 (5.88)	1 (2.94)
	Year II	98	88 (89.80)	3 (3.06)	5 (5.10)	0
	Year III	129	103 (79.84)	12 (9.30)	13 (10.08)	1 (0.78)
	Total	*261*	*220 (84.29)*	*17 (6.51)*	*20 (7.66)*	*2 (0.77)*
Ranong	Year I	51	45 (88.24)	0	3 (5.88)	3 (5.88)
	Year II	147	129 (87.76)	0	9 (6.12)	5 (3.40)
	Year III	96	86 (89.58)	1 (1.04)	3 (3.13)	5 (5.21)
	Total	*294*	*260 (88.44)*	*1 (0.34)*	*15 (5.10)*	*13 (4.42)*
Chumporn	Year I	25	21 (84.0)	2 (8.0)	0	1 (4.0)
	Year II	61	57 (93.44)	2 (3.28)	1 (1.64)	0
	Year III	26	25 (96.15)	1 (3.85)	0	1 (3.85)
	Total	*112*	*103 (91.96)*	*5 (4.46)*	*1 (0.89)*	*2 (1.79)*
Phang Nga	Year I	14	12 (85.71)	0	1 (7.14)	0
	Year II	51	47 (92.16)	1 (1.96)	1 (1.96)	0
	Year III	33	29 (87.88)	2 (6.06)	2 (6.06)	0
	Total	*98*	*88 (89.80)*	*3 (3.06)*	*4 (4.08)*	*0*
Phuket	Year I	20	15 (75.0)	1 (5.0)	2 (10.0)	1 (5.0)
	Year II	35	29 (82.86)	0	1 (2.86)	0
	Year III	27	25 (92.59)	0	1 (3.70)	0
	Total	*82*	*69 (84.15)*	*1 (1.22)*	*4 (4.88)*	*1 (1.22)*

Note: Year III data only from three quarters between October 2010 - June 2011
Source: TB-RAM Project Record, as of June 2011

According to WHO's guideline, the number of people stopping the treatment should be about 5% or less, if the patients have an observer to help them.[6] Although the overall default rates met WHO's guideline, more attention is particularly needed to improve the default rates among migrant patients in Tak and Kanchanaburi where the default rates were higher than 5%.

As per the death cases, about half of them had severe conditions due to human immunodeficiency virus (HIV) infection or acquired immunodeficiency syndrome (AIDS), whereas more than one-third were elderly or had other underlying health problems such as cancer and diabetes mellitus. Only about 12% died during TB treatment without any concomitant diseases.

Key Factors Contributing to the Treatment Outcomes According to the Project Record

Based on the secondary data review of the project record on case notification, case enrollment, and treatment outcomes, as well as the qualitative data obtained from the field visits, some observations could be made on key factors affecting the treatment outcomes, both positive and unfavorable outcomes, as summarized below.

1. Targeted Population Size

As mentioned earlier, the overall treatment success rates among targeted migrant patients to date seemed to be relatively high, with the range from about 85% to about 92% in different targeted provinces. When analyzing the detailed breakdowns of the treatment outcomes by provinces, the level of treatment success can be divided into two groups; again as Tier I (Kanchanaburi, Ranong, Tak) and Tier II (Phuket, Phang Nga, Chumporn) provinces with different total numbers of migrant patient cases enrolled. The Tier I provinces with higher numbers of enrolled cases tended to report lower success rates than the Tier II provinces with smaller numbers of cases enrolled. Since geographical characteristics in the two groups of targeted provinces are similar – i.e. both groups cover both crowded urban and scattered agricultural communities of migrants, this, perhaps, could be implied that the geographical context did not have much an effect on the treatment success, but rather concerns the size of patients enrolled. The principle of the Project to target a massive number of beneficiaries with limited number of staff may require the IPs to provide the services that exceeded their capacities and they have to rely largely on the volunteers who have limited knowledge and skills. While the proportion of 50 migrant households per one migrant volunteer is set as a standard for the implementation, although the physical environment such as the geographical coverage and accessibility to the targeted communities should also be taken into consideration, there are no set criteria for appropriate number of Frontline Social Networkers (FSNs) or Migrant Liaison Officers (MLOs). As shown in Table 9 below, the total number of the project's FSNs/MLOs increased from 59 to in Year I to 76 in Year II and dropped to 66 in Year III. Although the trends of these figures in all provinces were similar, i.e. increased in the Year II and dropped in Year III, these were not proportionate to the numbers of patients they had to provide the services to. The absolute numbers of patients enrolled sharply increased in the Year II and remained at similar levels in Year III in the Tier I provinces while the figures of all Tier II provinces have been much lower over the years. Therefore, it could be a challenge for the provinces with larger numbers of patients to manage larger numbers of migrant volunteers, who in turn provide DOT and TB knowledge to the patients and communities with limited number of FSNs/MLOs. In addition, TB knowledge and supervisory skills of FSNs/MLOs tended to vary widely and this could result in unharmonized standard of care delivered by different FSNs/MLOs.

It is important to note that overall, many of the unsuccessful treatment cases in all provinces were due to the deaths rather than loss-to-follow-up, except for Chumporn and Tak where proportions of defaulted cases were higher than other unsuccessful treatment results. It is also worth noting that the treatment failure rates in Tak and Ranong Provinces were about 2.5 to almost 6 times higher than those of other provinces. This is probably because Tak and Ranong had somewhat higher proportions of retreatment cases (Table 3) that could lead to drug resistance.

Table 9. Number of Migrant Liaison Officers / Frontline Social Networks by Province and Implementation Year, October 2007 – September 2010

Province	No. of MLOs/ FSNs in Year I	No. of MLOs/ FSNs in Year II	No. of MLOs/ FSNs in Year III
Tak	7	13	11
Kanchanaburi	10	10	6
Ranong	19	22	19
Chumporn	11	11	10
Phang Nga	12	15	14
Phuket	0	5	6
Total	**59**	**76**	**66**

Source: TB-RAM Project Record

Key Factors Contributing to the Treatment Outcomes According to Inputs from Patients and DOT Partners and Supervisors

2. Type of Patients / Location of the Patient's Residence

Among the six targeted provinces, Kanchanaburi reported to be the province with highest proportion of both default and death cases over the past almost 3 years (Q1-Q11; Table 8). This was reported by the IPs' staff that it was probably due to difficulties in following up with cross-border patients and that cross-border patients tended to visit the health facilities with more severe conditions. A further analysis on the treatment situation in Sangkhlaburi District of Kanchanaburi Province – the only site among the 14 targeted districts that also enrolled cross-border patients to the project's coverage – provided interesting information for further discussion and investigation as shown in Table 10 below. Overall, the default and death rates among all 170 migrant TB patients in Sangkhlaburi District during this period were almost equal (9.41% and 8.82%). The treatment success rate among 120 patients residing in Thailand was almost 87%, while the default and death rates were about 8% and 5%, respectively. TB treatment among the 50 cross-border patients reported almost 20% lower success rate at about 68%, whereas the defaulted (12%) and dead (18%) were much higher than those in Thailand. This supports the opinion of the IPs that cross-border patients tended to access the TB care and treatment with more severe conditions, while following up with cross-border patients to avoid defaulting might be a big challenge. However, comparing within the same group of patients, i.e. those residing in Thailand and in Myanmar, the record showed that there were more defaulting (8%) than deaths (5%) among those in Thailand than those in Myanmar (12% vs. 18%). This contradicts to the opinion of the IPs that it was more difficult to follow-up with cross-border patients.

However, this phenomenon could be explained by a couple of factors. The IPs might have put more emphasis on cross-border patients based on their opinion that there is higher potential for defaulting among cross-border patients. The patients themselves might have more health consciousness and valued the treatment in Thailand as a great opportunity that they would not be able to obtain from their home country. Similar to the WVFT's clinic in Ranong, with a track record in providing health care services to vulnerable and poor

populations in Sangkhlaburi for about three decades, KRCH is well known among local people living along the border on both sides. Although the KRCH focuses their services on facility-based for patients, they tended to have a strong network of health volunteers in Phayatongsu community in Myanmar side that was established over a decade ago and continued to be active to date. Nonetheless, these factors are anecdotal according to a small number of interviews with IPs' staff and available secondary data from the Project. It is highly recommended that further study on this specific issue in Sangkhlaburi and other "twin-city" areas be conducted to better address TB control as well as to avoid jeopardizing the cross-border patients if, in fact, the cross-border status is not a real barrier to the treatment success.

Table 10. Treatment Outcomes among Migrant TB Patients by Location of Patients' Residence, October 2007 - June 2010

Patients' Residence	All TB Cases	Cured & Completed (%)	Defaulted (%)	Died (%)	Failed (%)
Thailand	120 (100.0)	104 (86.67)	10 (8.33)	6 (5.0)	0
Myanmar	50 (100.0)	34 (68.0)	6 (12.0)	9 (18.0)	1 (2.0)
Total	***170 (100.0)***	***138 (81.18)***	***16 (9.41)***	***15 (8.82)***	***1 (0.59)***

Note: Data from October 2007 - June 2010 (Q1-Q11)
Source: TB-RAM Project Record, as of June 2010

3. Patient's Intention

According to the interviews with 11 patients who already completed the treatment, they reported being on medication for 8.5 months on average, ranged from 6-14 months. All the patients, former and current, and 11 DOT Supervisors interviewed agreed that the biggest challenge that all patients have to face while on treatment are side effects of the TB drugs. About two-third (15/22) of the patients interviewed experienced one or more adverse drug reaction: mostly joint pain (8), followed by headache (6), nausea/vomiting (5), itchiness (4). Other less commonly found adverse drug reaction were blurred vision, body pain, shortness of breath, numbness, heartburn, sweat, dizziness, and temporary short of memory short (one each). Some patients were afraid of taking so many tablets of medicine, their bitterness, and the injections.

As a result of a combination of the patient's physical weakness and the side effects of the medicine, almost all of the patients could not work at all while they were sick; this resulted in the loss of income to support their families and added more burdens to their low-income families. As migrants in general often work irregular hours, depending on when the employers request them to work, taking medicine on time for many months is a big challenge for many of patients. A few patients interviewed admitted that they did not always take medicine on time but they at least tried their best to adhere to the treatment. Also, when asked if they ever thought about stopping their medicine, a few of them admitted that they used to think about it from time to time but none of them actually did as some of them said:

"I thought about it but never stopped. I didn't want to die but thinking that I wouldn't make it no matter how good the treatment was, it made me felt that I'd rather die.... I was very nervous and paranoid as I was so suffered".

(44 years old male, former patient)

"Yes, but I never stopped. I want to be cured, so I had no choices but to take medicine. I don't want to be suffered".

(56 years old male, current patient)

Some interruption can make the patient feel discouraged, as one of the patient experienced:

"I was admitted at Yangon Hospital but had to discharge and join my husband's family in Kawthoung after the Cyclone Nargis. The doctor gave me 3 months medicine when I discharged but I thought of stop taking it. I felt that the disaster and travelling made things more complicated and difficult for me".

(27 years old female, current patient)

Nonetheless, most of the patients believed that no one could help them to mitigate their suffering but themselves, and therefore, their strong intention to get cured was the most important factor to help them fight with TB.

"I don't dare stop taking the medicine as I'm afraid I'd have to start it all over again for another 6 months. Even though I'm afraid of taking medicine, I have to take it so that I'll be cured.....I'm the one who got sick, so I have to be responsible for myself. I'll do whatever I've to do to be cured. I don't want to be suffered like this".

(22 years old male, current patient)

"I was sick of taking medicine but never thought of stop taking it. Even if nobody came to tell me to take medicine, I'd have to continue it. I wanted to be cured. Nobody could help me but myself. I didn't want to die. For TB, if we don't take medicine, we'll die. It's the same in Myanmar. My parents and grandparents used to tell me that some people coughed out blood and died".

(46 years old female, former patient)

"I was very cautious about taking medicine that I stopped taking the jobs in other towns or staying overnight somewhere else. After a month or so, I got use to it, so I carried medicine everywhere I went".

(44 years old male, former patient)

Some patients developed their own defense mechanisms to encourage themselves to keep up with the treatment.

"Medicine is good. It's fun to take medicine as I don't have any other things to do".

(70 years old male, current patient)

"Sometimes I felt discouraged. I tried not to think or to worry about anything more than usual. I only need to remember the time to take medicine".

(58 years old female, current patient)

"It's not only me, many other people also got TB".

(25 years old female, former patient)

"I want to be clean from TB……Some other patients have to be on treatment for longer than me".

(32 years old male, current patient)

"My neighbor also got TB and cured after taking medicine for 6 months. I'm older and got more severe condition, so I thought it's natural for me to take longer time to cure".

(52 years old male, current patient)

While some learned from direct experience that the treatment really helped improve their health conditions.

"I'm a human being now. I felt like I was reborn. After a couple of months [of medication], I got better. It made me felt that I'd be cured as I got better after taking the medicine….I can walk now. I couldn't walk before….I was very tired when I worked. I couldn't even chat like I'm doing with you [researcher] now".

(52 years old male, current patient)

"I did it for my own life. I didn't want to suffer myself with bad abdominal pain again".

(78 years old male, former patient)

The DOT Partners and Supervisors interviewed expressed the same opinion that the most important factor contributing to the treatment success is the patient's own health concern and their intention to get cured, as they mentioned below:

"It's mainly depended on how strong [mentally] the patients are. Medicine is not a candy. It's boring to take medicine for a long time and it also has a lot of side effects. The patients have to be confident and have a faith in themselves. DOT Partners can't do anything much but to give them moral support".

(A group discussion with DOT Supervisors)

4. Families and Friends

Most of the migrants from Myanmar migrated to Thailand as a family, which is also the case for most of the migrants who participated in the interviews, as reflected in the Table 1 above. Their strong ties with families encouraged them to keep up with the treatment. As also indicated by the DOT Partners and Supervisors, most of the migrants stated that their families, particularly children, were the key factors that made them feel that they had to be

strong and healthy, so that they could in turn support and protect their families: some of them said:

"If I don't get cured, how my kids will survive?......My daughter gave me strength, she told me I had to be serious on taking medicine".

(25 years old female, former patient)

"If I didn't get cured, I might pass it to my kids".

(25 years old female, former patient)

"I wanted my family to live well and eat well. If I died, their lives would be very hard".

(55 years old male, former patient)

"I want to help my children to taking care of my grandchildren".

(45 years old female, current patient)

"I felt helpless and hopeless that I got it [TB] again. I don't know what happened to my life. I have to get 57 injections this time.......My kids are still very young. I'm worried about them. I'm glad they are good kids and always obey me. They make me feel strong and that I should take good care of them.......My husband gave me strengths. He told me to take medicine every day and that this disease wouldn't kill me if I took medicine. I was going to separate our meals but he told me it's not necessary as we are a couple. I was very happy with his words......He also said that the most important thing is my health.... He still supports me this time like before.... ".

(30 years old female, current patient)

"My husband is very nice to me. He does many things for me. When I was worried that I was too thin, he said "it's okay, you'll gain weight soon". He told me I don't have to work anymore".

(58 years old female, current patient)

"I wanted to be cured so that I could do whatever I wanted to do and go wherever I wanted to go. I want to earn a lot of money so that I can go home and live with my old parents. I want to open a small glossary store at home".

(34 years old male, former patient)

"My mother watched me take medicine every day. She loves me and worried about me so much that she cried every day when I was sick.....I didn't want to see her cried".

(21 years old female, former patient)

> *"My sister in-laws is very good to me. She gave me moral support. I can tell her and my husband all my troubles and suffers. It's kind of relief".*
>
> **(27 years old female, current patient)**

In addition to families, social network among migrant communities also seem to be another strong factor that helped the patients in coping with the disease. Since most of the migrants have been in Thailand for a long time as shown in Table 1 above, and that most of them came from agricultural society where neighbors always maintain close relationships, their community networks in Thailand are quite strong.

> *"I wanted to be cured so that I could get back to the group. While sick, I didn't want to join my friends.……I didn't want others to get it from me as we usually share the cigarettes and drinking glass".*
>
> **(34 years old male, former patient)**

> *"The aunty next door cooks and brings foods to me two times a day. Sometimes, she also brings me some snacks. A couple of my neighbors who got TB and already cured told me to take medicine regularly. They said not to feel sad as they used to cough out blood and still could be cured".*
>
> **(22 years old male, current patient living alone)**

However, the interviews with two current patients – one experienced having TB twice while living in two different communities – suggested that it takes some time for migrants to establish themselves within the community network, while economic situation of the neighbours may not allow them to support the patients as they want as quoted below.

> *"My neighbors are very nice. They come to visit and chat with me all the time. They've been in this community for more than 10 years. Our family is the last to move in about 7 years ago".*
>
> **(30 years old female, current patient)**

> *"They [neighbors] gave me moral support last time [that I got TB] as I lived in that community for many [6-7] years and had many close friends. This time, my neighbors are poorer than me and I just moved here a couple of years ago, so they can't really support me. Sometimes, they said they wanted to cook some foods for me but they don't have time".*
>
> **(58 years old female, current patient)**

According to the DOT Supervisors and Partners, while support from friends and neighbors can benefit the patient's treatment and recovery from TB, the downside of it is that some friends or neighbors may sometimes provide incorrect information or misconceptions to the patients. This was confirmed during the interviews with many patients that they had to avoid eating some foods to cope with the disease or to prevent relapse. It is worth noting that the misconceptions were found more in younger patients, as some of them said:

> *"People in my community said that I should avoid cold water since the TB germs like cold things and can expand quickly if I drink cold water".*
>
> **(27 years old female, current patient)**

"I stop eating guavas because it produces more sputum. I avoid oily foods as it causes weeping sound and I can't sleep. I don't eat pork as it'll be difficult to breath. I also don't take cold drinks as they can make me cough".

(30 years old female, current patient)

5. Physician

The Myanmar tradition that medical doctors are highly respected and the patients have to obey to the doctor's advice also reported to have some effects on the TB treatment as one of the interviewed patients said:

"I'm a patient, so I have to listen to the doctor. I'm sick, so I have to take medicine. It's normal".

(58 years old female, current patient)

While one of the interviewed patients mentioned that "it's the doctor's command" for him to take the medicine and he had to follow that command, another reflected the doctor's threat that if the patient stopped taking medicine for only one day, s/he had to start it all over again. Some others echoed a positive doctor-patient relationship as quoted below.

"I'd been in Bangkok for a long time and didn't have many people that I know here. The doctor gave me courage. S/he told me not to think too much as I'd be cured soon. The doctor was so kind to take care of me days and nights".

(44 years old male, former patient)

In Muang Ranong, the WVFT also operates a clinic where 2-3 Myanmar doctors are on staff to provide initial diagnosis and treatment on general health issues that mainly requires medicine that are available over the counter to migrants. The Clinic also assist the government's provincial hospital in managing migrant TB cases by providing consultation, counseling, and other services to the patients according to the diagnosis and prescriptions from the hospital. This was highly valued by the migrant patients since the services provided by Myanmar doctors are more accessible than the government health facilities where they have to rely on translators in communication with the Thai doctors. However, the key value here is not the presence of the Clinic per se but rather the availability of the Myanmar doctor.

6. Spiritual and Religious Beliefs

Among the 22 patients interviewed, a couple of them are Christian and the rest are Buddhist. Many of them are religious and visit the church or the temple regularly. Six of them mentioned applying spiritual and/or religious teaching and/or practices to cope with their sicknesses. For example, a few of them pray and meditate regularly, especially when they feel the pain. A 47 years old, male current patient who is a Christian expressed that:

"God gives me strength, so I pray every morning and before and after I take medicine… He tells me not to be discouraged. He gives me a lesson so that I'll be a more patient and a better person……Friends at the church who know that I'm sick also pray for me".

(47 years old male, current patient)

7. Patient Self-help Group

One of the sites visited for this research implements monthly patient's self-help group (SHG), aiming to provide psychosocial support to the patients through a peer support strategy. Through games and group exercises facilitated by the IP's staff, the group of 30-40 former and current patients share their TB knowledge and symptoms and treatment experience. Although it is difficult to draw a causal relationship between attending the SHG and the treatment outcomes among migrant patients, a few of them spoke highly about the SHG - that it is a good way to learn about TB and for release of stress, particularly for those who did not disclose their TB status to their neighbors or colleagues at work. For example:

> "*I had to take medicine correctly to be able to join the SHG. I've learned a lot about TB. It's fun and they also provide us lunch and snacks. Sometimes, they also give us some gifts......The staff make me feel like a family. I'm so thankful to them. Even I'm not on a treatment now, I still look forward to joining the group. I don't want to get TB again but I'll continue to join the group if I'm still here.....I can meet new friends. The staff said that anybody could get TB if they are weak so we shouldn't feel bad or sad. They also told us that if we found someone with TB symptoms, we should advise them to get tested*",

(21 years old female, former patient)

> "*It makes me happy and forget about the tiredness and the fatigue as it's fun and we also receive some nice lunch and snacks......I can laugh. A friend who is nearly cured told me that he also got the same side effects but got better after a couple of months. The doctor also said the same. So I think I'll get over it [side effects] after a while*", and

(52 years old male, current patient)

> "*My favorite part is when we talk about TB. We share experiences on our symptoms and treatment. I learn more about TB this way. I joined them since the first time I got TB but stopped when I finished the treatment. I want to go back to join them again*".

(58 years old female, current patient)

While this strategy and activity seem to be helpful to patients, these are not implemented across the project sites, possibly because of the lack of knowhow and that this strategy/ activity was not established as a core standard operation procedure or an essential strategy of the Project.

8. Patient's TB Knowledge and Perceptions

Health related knowledge and perceptions are always cited as the key factors for positive health changes of health behaviors and practices, and health knowledge and awareness are usually the main parts of most, if not all, of the Behavior Change Theories.[9] Unfortunately, since this study was conducted in a retrospective manner and only information from former patients who successfully completed the treatment and current patients could be obtained and

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[9] Karen Glanz, et al (1997).

the defaulted cases could not be identified; it is difficult to conclude if the patient's knowledge and perceptions have direct impacts on the treatment outcomes. Nevertheless, the findings on TB knowledge and perceptions from this research reflected some key issues with some linkages to the treatment outcomes as described below.

Based on the interviews with 22 patients, it is clear that their level of TB knowledge is quite low (Table 11). Only slightly more than half of them (12/22) mentioned that TB could be transmitted through the air, cough or sneeze, and only slightly more than one quarter (6/22) reported sharing foods or drinks as a mode of TB transmission. A few of them mentioned that physical weakness, sharing eating utensils, living/sleeping together, and working too hard could make them sick with TB. While one of them mentioned alcohol drinking as a mean to get TB, none of them mentioned smoking. When asked about how to prevent TB, half of them said cover one's mouth/nose when coughing or sneezing. Interestingly, almost one quarter (5/22) mentioned taking medicine as a way to prevent TB, and all of them were patients interviewed in Ranong (5/11) although only they had very little knowledge on TB, i.e. only three out of the five patients knew ones should cover their mouths/noses when coughing/sneezing to prevent TB and did not know other ways to prevent TB. According to the DOT Supervisor in Muang Ranong, this is probably because they emphasized to the patients the message on treatment is a means for TB prevention. A few of them mentioned that they should avoid sharing foods or drinks, avoid crowded places, maintain personal hygiene and exercise, and improving air ventilation could help protect them from getting TB. Again, while one of them said stop drinking alcohol can help prevent TB, none of them mentioned quitting smoking. Although the methodologies and the tools used to collect data were different, key findings on the TB knowledge among the interviewed patients were similar to those from the Baseline Survey on Knowledge, Attitudes and Practices related to TB conducted among migrant communities in the 14 targeted districts by the Project in 2008-2009.[10] The similarity, however, is not in term of the detailed knowledge on modes of TB transmission or the prevention methods, but rather on the overall picture that respondents from both studies had low level of TB knowledge.

Among the 22 patient interviews, 81.82% (18/22) knew that TB is treatable and curable. The reason that not all the interviewed patients agreed that TB is treatable and curable might be because they have had both positive and negative experiences related to TB treatment as two of the four patients who did not know or were not sure if TB can be cured are relapsed cases who had already been on medication for about 7 and 12 months for the current episode. The other two are current patients, in which one of them had already been on medication for nine months at the time of interview, while the other had been on treatment for about three months but felt that his condition had not improved. Importantly, a couple of interviewed patients did not believe that TB is an infectious disease; while many have limited and specific TB knowledge, this ignorance impacts contact tracing. This is probably because of their lack of the knowledge and belief on the germ theory that is common among individuals with low or no formal education. In addition, too much emphasis on coughing as a leading sign for TB made some interviewed migrants believe that there is no need for a person who does not cough to get TB test. One of the patients believed that TB was not communicable because she already got TB twice and her husband still had never coughed, while another patient thought that her son who had TB at the lymph node did not get it from her because he did not cough and did not get the lung TB as she did.

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[10] Melvin Q. Magno, et al (2008).

Table 11. Level of TB Related Knowledge among Migrant Patients in 2011 and among General Migrants in Targeted Communities in 2008

Mode of Transmission	No. of Respondent (N=22)	Baseline Survey Result	Prevention Method	No. of Respondent (N=22)	Baseline Survey Result
Air/Cough/Sneeze	12 (54.55%)	66.6%	Cover Mouth/Nose	11 (50.0%)	47.0%
Sharing Foods/Drinks	6 (27.27%)	Not Available	Take Medicine	5 (22.73%)	Not Available
When a Person is Weak	3 (13.64%)	4.5%	Avoid Sharing Foods/Drinks	2 (9.09%)	Not Available
Sharing Eating Utensils	2 (09.1%)	39.4%	Avoid Crowded Place/ Isolation	3 (13.64%)	Not Available
Live Together	2 (09.1%)	Not Available	Keep Personal Hygiene/Exercise	2 (9.09%)	10.4%
Work Too Hard	2 (09.1%)	2.2%	Improve Ventilation	2 (9.09%)	Not Available
Drinking Alcohol	1 (4.55%)	10.4%	Stop Drinking	1 (4.55%)	27.9%

Note: Interview data obtained from a free-listing method with multiple answers allowed
Sources: 1) Field data collection
2) Melvin Q. Magno, et al (2008).

The low level of TB knowledge and misperceptions found among the patients is probably due to their relatively low level of exposure to TB education intervention. As shown in Table 12 below, half of the interviewed patients reported that they received TB knowledge from the government and the IP's doctors who provided treatment to them, while almost another half received the knowledge from NGOs including both the Project's IPs and others and two of them reported never received TB knowledge. When asked about their experience in joining any community TB education or campaign activities, more than half of them (12/22) said they had never participated in any of such interventions. About one-third (7/22) of them (but almost two-third of those in Muang Ranong) reported attending the SHG activities, while three of them used to participate in the TB education session in their communities conducted by the IPs and other NGOs working in the same catchments areas. The low level of exposure to TB education interventions among the patients was reported to be due to limited number of interventions conducted by the IPs since the community TB education is not a main objective of the Project and does not have the budget allocated for the community education. Some patients also mentioned that some Myanmar migrants still have a misconception that TB cannot be cured even if the patients took medicine since they have heard that many patients in Myanmar died while on or after the treatment. In addition to limited TB education interventions, means and methods used for patients are also important. Many interviewed patients who received TB information mentioned that they could understand only half or less of the information delivered to them by doctors or other staffs. While some received information verbally and could not remember the details, some received reading materials when they could not read fluently, and some received advice that might be difficult to follow, e.g. to avoid people who have TB while it is hard to know who has TB.

Table 12. Source of TB Knowledge Exposure to Community TB Education among Interviewed Migrant Patients

Source of TB Knowledge	No. of Respondent (N=22)	Exposure to TB Education in Migrant Community	No. of Respondent (N=22)
Doctor/Nurse[#]	11	Never	12
NGOs*	9	Self-help Group[+]	7
None	2	Community Outreach*	3

Source: Field data collection
Notes: [#] Doctors from both government and NGO' clinics. Also includes two respondents who received the knowledge from health personnel in Myanmar.
* Project's implementing partners and other NGOs
[+] By the Project's implementing partners

This study revealed that limited and specific TB knowledge and awareness can lead to delayed health care seeking, especially among patients notified through their visits to health facilities, which in turn can result in the more severe conditions, the treatment outcomes, the time required for the patients to recover, and the chance of spreading TB to others. Almost all of the patients, both former and current patients, reported a long period of self-medication, either with traditional or modern medicine, before visiting the hospital. On average, the interviewed patients waited for more than five months since the time of onset to decide to seek proper health care; a few of them were finally diagnosed as TB patients after one to two years after the onset. Many of them thought that they got asthma or other illnesses. One of the patients who seek proper health care after 12 months of onset explained that:

> "*I don't know what TB is.......I didn't see the doctor at first because I thought I got malaria.......When I attended a training, I was told that TB patients would have a fever in the evening for more than 10 days, lose weight, cough for more than 2 weeks, but I had a fever not only in the evening and I coughed for less than 10 days, so it should not be TB. I thought I coughed a lot because I ate too much sweet and milk. Grandmas and grandpas told us this so people in my hometown believe like this. I never thought that I'd get it [TB]*".

(45 years old female, current patient)

In addition to the knowledge, the patient's awareness and perceptions could also affect the delayed diagnosis and treatment that could make the treatment more difficult. They may also put the patients for the risk of relapse or reinfection, and perhaps for risk of infection among their families.

> "*I was too lazy to go to see the doctor as I thought I was fine since it's not a serious problem. The doctor complained that I left it till it got so bad and difficult to treat*".

(46 years old female, former patient)

> "*I don't know if it can happen again after treatment. It depends on my sin. I just have to wait for the doctor to tell me what to do*".

(45 years old female, current patient)

"*The doctor said that I shouldn't get pregnant while on medication......but it happened. But I was not worried as in Myanmar we believe that a child delivery will help bring bad thing [blood] out and we'll become healthier*".

(25 years old female, former patient)

On the other hand, correct information and health awareness can reflect positive perception as some patients perceived the TB test and treatment as their opportunities and were very satisfied with the services that the Project provided as they expressed that:

"*It's a good opportunity [to get treated and cured]. I can work more and earn more money after the treatment*", and

(22 years old female, former patient)

"*My other 2 daughters got tested and also have to take medicine for 6 months. I'm glad my kids are taking the medicine to prevent it*".

(30 years old female, current patient)

9. Stigma and Discrimination

Stigma and discrimination is another common factor that is considered as a key barrier to service provision and access. Although it is not possible to draw a link between stigma and discrimination and the treatment outcomes as per the same reason mentioned earlier, several patients reported that they had not experienced stigma and discrimination from families and/or communities. Health care providers from both government units and the IPs agreed that stigma and discrimination towards TB patients in the targeted communities has been reduced over the years, which is a good sign. However, discussion with a few patients suggests that this issue still remains in the community and in the family, and had some effects on the enabling environment for the TB treatment as some patients mentioned that:

"*I want to be cured because getting sick with this disease, I feel that I'm different than others and I have to cover my mouth all the time so my friends don't want to visit me. Only the volunteer comes to visit me*", and

(45 years old female, current patient)

"*It was disgusting before. My wife always complained that it's disgusting*".

(34 years old male, former patient)

As stigma and discrimination towards TB patients still exist in the community, some DOT Partners mentioned that while visiting the patients, they also had to observe the environment surrounding the patients such as their families, communities, and employers. When stigma and discrimination were found or suspected, they would provide an explanation to those who stigmatized the patients that TB can be treated and cured, and that anybody could get TB including those who stigmatized the patients. In case of the employers, they had to explain that the patients needed to take some rest and be absent from work for sometimes.

10. DOT Partner

Theoretically, trained DOT Partners are considered as effective factors that can contribute greatly to the success of TB treatment. However, there are many types of DOT Partners applied in different settings such as family members, health care providers, and community health volunteers.[11] For the TB-RAM Project, although the main purpose is to implement community DOT by migrant volunteers, DOT provided by family members and/or neighbors of the patients have also been implemented as deemed appropriate, since having volunteers visiting the patients on a daily basis can unintentionally disclose the patient's TB status to community and this could do more harm than good to the patients if communities still have strong stigma and discrimination towards TB patients. During the initial clinic visits, the health providers would discuss with the patients and agreed on administration of the medication. This probably resulted in small echo on the DOT volunteers as key contributors to the treatment success as relatively small proportion (8/22) of interviewed patients reported that they received DOT from volunteers. Some walked to the IP's office or the volunteer's house to take the medicine daily as they lived in a walking distance. Half (12/24) of the migrants interviewed (10 patients and two family members who were on prophylaxis) administered the TB drugs by themselves from a monthly stock delivered to them by DOT Partners and have some family members and/or neighbors looked after them daily. This approach is relevant in terms of demonstrating the provider's respect for the patient's autonomy to make their own decisions on their treatment process. However, according to the Myanmar's, as well as other Asian countries contexts, the patients might hesitate to request a volunteer to visit and deliver the medicine to them daily, as one of them expressed:

> "*The volunteer kept medicine at home. For the first month, my husband took me on a bicycle to take the medicine at the volunteer's house as I couldn't really walk. I was so tired and powerless that I almost fell down from the bicycle. Later, when I got better, I walked to the volunteer's house by myself......I hesitated to tell the volunteer to come to deliver the medicine at my house*".

(25 years old female, former patient)

The DOT Supervisors also experienced hesitation of the clients as they mentioned during the group discussion that:

> "*Sometimes, the patients hesitate to ask volunteers to come to their houses, especially if they [the patients] are younger than the volunteers or if they don't have severe symptoms*".

(A group interview with DOT Supervisors)

To determine the level of influence of DOT Partners on the treatment process and outcomes, this issue was specifically probed during the interviews with patients. A couple of them agreed that DOT Partner was one of the key factors contributing to their treatment success. More patients viewed DOT Partners as additional means to remind them to take medicine and to ensure that they took medicine on time. In addition to small proportion of interviewed patients who (had) received DOT from volunteers, their low perception regarding the influence of DOT Partners on their treatment success might also be due to the limited roles of

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[11] World Health Organization (1999).

DOT Partners in both interviewed sites as some of the interviewed patients mentioned that they had no understanding of the role of volunteers, although they knew who in their communities were volunteers.

Limited level of TB knowledge and skills for patient care and psychosocial support among DOT Partners might play a vital role in the low visibility of their contribution. According to the interviews and a group discussion with 13 DOT Partners in the two selected sites, it was found that the level of TB knowledge among DOT Partners varied widely but overall was relatively low. They admitted that they could only understood about 70-80% of what they had been trained since the TB issue, the case management, and drug resistance were so complicated in their opinions. As majority of them had primary education, it was a challenge for them to understand the germs theory and drug administration. Also, as many of them are young, they sometimes could not handle the cases well, especially when dealing with the patients with some psychological or emotional issues. However, it was agreed among interviewed DOT Partners, DOT Supervisors, and the Project staff that providing TB knowledge to the patients was not a responsibility of the DOT Partners/Supervisors and this was not specified in their job descriptions, but rather to visit the patients to ensure that they continued the treatment and to identify more cases to refer to the Project

Among the DOT Supervisors who are fulltime staff and have the supervisory roles to the DOT Partners who are volunteers, it was reported that they sometimes received contradictory information that made them confused, e.g. some trainers said TB could be transmitted through sharing meals and/or eating utensils while some said it could not be transmitted this way. They also mentioned the difficulty in applying what they learned from many trainings they had been attending to real life situations. When probed about the training, they reported that a series of training on various relevant topics had been provided them, usually on a quarterly basis. However, it was also reported that some volunteers had not received new or refresher training in the fourth year of implementation due to lack of budget. In addition, as the volunteers are also migrant labours and many of them have to earn incomes for daily living, they tend to be as mobile as other migrants in the targeted communities; hence, the high turnover rate among the volunteers in some areas. It was obvious that DOT Supervisors who are fulltime staff on the Project had much higher level of TB knowledge and consultation skills than the DOT Partners who are volunteers, and DOT Supervisors who had been on the service for a longer period of time tended to have better knowledge and skills than the newly recruited ones.

Overall, all of the interviewed patients expressed their appreciation to the DOT Partners and IPs' staff, which could indirectly reflect their contributions to the treatment success, especially for their kindness and for:

- providing them with supplemental foods and nutrition and moral support, and sometimes living stipends and some gifts;
- going to the hospital to get the monthly medical prescriptions and deliver the medicine to them;
- taking them to the hospital on the appointment dates;
- paying regular visits to the patients (ranged from daily, 2-3 times/week, once a week, and 1-2 times/month);
- collecting sputum from the patients; and for
- taking them to join the monthly patient's self-help group activities.

It is noteworthy that, although the issue was raised by only a couple of the DOT Partners interviewed, the language barrier was raised as one of the difficulties in providing the service to migrant patients. This is because migrant population in many targeted areas are comprised of various ethnicities. Although the IPs have tried to match the patient-provider with the same ethnicities and their native languages, it is sometimes difficult to find the providers that fit the criteria and the service has to be provided through a translator such as the patient's family members or neighbors.

11. Patient's Socioeconomic Status

Although there have not been many cases that were loss-to-follow-up (terminology), the interviewed DOT Partners and Supervisors reported their observations on some key factors and unique characteristics of default patients. Besides the patient's acceptance that they got TB as well as their acceptance on the case management method, the rest of the factors/ characteristics raised were all related to the patient's socioeconomic status. They observed that the patients who lived alone without family or close friends who understood them; those with low-paid and tough jobs; and those who had insecure housing, either because they could not afford to pay the rent while sick or because the house owners forced them to move out when learned that they got TB, would have a higher potential to discontinue the treatment and disappeared from the targeted areas. The socioeconomic status of the patients seemed not only to affect the treatment outcome but could also be a cause for stigma and discrimination as one of the patients expressed:

> "*I want to be cured. I don't want to be in this condition that I can't work and have no saving....no one wants to talk to me as I don't have money. I have to accept the truth that I'm sick, so I have to take the medicine*".

(47 years old male, current patient)

12. Patient's Mobility

High level of mobility among migrants has always been cited as one of the major difficulties in providing not only TB but also other health and social services to migrant population in general. However, it might not be appropriate to conclude that mobility is a key factor for default cases. The data related to the treatment outcomes among migrants residing in Thailand and in Myanmar as mentioned earlier could not be interpreted that the patients residing in in Myanmar were more mobile than those in Thailand. In addition, the decreased number of notified cases in Year IV in Kanchanaburi was reported to be due to the emphasis put on active case findings by both government and non-government sectors in the previous years where a large number of TB cases were already identified, resulting in the difficulty in identifying more new cases in this area. This could somewhat be implied that, in fact, the vast majority of the targeted migrants was not highly mobile and the information obtained from the patients also supported this interpretation.

According to the patients interviewed, they had been living in the interviewed sites for over a decade on average. Although most of them admitted that they used to live and work in other provinces in Thailand and travel back and forth between Thailand and Myanmar to visit their families and for festivals, only one of them had a clear plan to move to another province to join her husband once she completed the TB treatment. While three of them strongly expressed that they would not migrate further as one of them said he wanted to die at his current place, six of them said they would migrate with certain conditions such as if there

were some security issue due to fighting in Myanmar that forced them to relocate again. Most of them dreamed of going back to their hometowns once they earned enough saving to build a house or to run a small business, although they did not foresee that this would happen in a very near future.

13. Access to Health and Related Services and Information

Two of the 22 interviewed patients mentioned that free medication was one of the key factors to help them and other patients to continue the treatment as they stated that:

> "…..If I were in Yangon, I wouldn't go for the treatment because I'd have to pay a lot of money", and

(28 years old female, former patient)

> "We should tell migrants to see the doctor when they fall sick. But if they don't have money, then nothing they can do but to take care of themselves".

(78 years old male, former patient)

Lack or limited access to health and related services is the key constraint for improving health conditions among migrants, not only in Thailand but elsewhere. As one of the member states of WHO that jointly initiated and endorsed the World Health Resolution on the Health of Migrants in 2008, the RTG has been developing strategies to tackle the improvement of health information and service access among non-Thai populations in the country. One of the strategies is to allow irregular labor migrants to register and join the Compulsory Migrant Health Insurance Scheme (CMHIS), in which they have to pay THB 1,300 annual fee and THB 30 per visit when utilize the service at designated health facilities. Since 2009, the ethnic and indigenous persons who are still on the process for the Thai nationality verification and did not have access to the National Universal Health Coverage Scheme (UC) were also given the UC cards; meaning that they can receive free medical services from the designated health facilities subsidized by the RTG. Nevertheless, many interviewed patients waited until their conditions became so severe to seek proper health care because they did not join any of the public health schemes (9 of 22 interviewed patients); did not know how to use the health insurance that they were entitled to; and did not know about the support provided by the TB-RAM Project. One of them said she and her husband had to quit the job in Bangkok and moved to the interviewed site because they did not have the health insurance card and could not access the health service in Bangkok. Their relatives who knew that they could access the health services at the government hospital at the interviewed site told them to move here to get treatment. Although more than half (12/22) of the patients interviewed were holding either the CMHIS or the UC cards, not all of them used the cards to access health services while they were sick. A few of them had no understanding what the cards were good for but as the cards were issued by the RTG they knew that the cards were important and should be importantly kept, but did not seek earlier health care. Some of them knew that they could receive free medical care with the cards but did not know how to proceed at the hospital and did not know that translation services in various migrant languages were available at the hospitals, and therefore, did not seek health care until they became very severely ill. Although it is unclear whether the delayed access to TB treatment resulted in negative treatment outcomes, it is clear that early access can help shorten the time and lower the level of suffering that the patients had to face.

In addition to the health service access, availability and accessibility of the service were also reported to be essential in supporting the TB care. One of the DOT Partners suggested that the Community Health Centers, recently renamed as the "Sub-district Health Promotion Hospitals", should be able to provide the TB diagnosis and treatment to the patients to save their travel costs or to provide accommodations to the patients while on treatment. However, this might not be feasible since the "Hospitals" do not have a physician or a technician on staff but only the nurses or public health practitioners. The same DOT Partner also raised the importance of the service provider networks to enhance the effectiveness of the service as the patients may move to the catchments areas of other organizations and it would be easier for the other organizations to follow-up with the cases. Another DOT Partner interviewed separately mentioned a constraint she had faced that support the suggestion of the other DOT Partner. Since a number of the DOT Partners are migrant volunteers who do not have a residential permit issued by the RTG, they cannot travel to a place far away from their residence or workplace to avoid being arrested. For those with a residential permit, theoretically speaking, are not allowed to travel outside of their registered areas. These made it difficult for them to follow-up with some cases. Additionally, some interviewed patients indicated that they prefer to visit the IP's clinic rather than the government hospitals because the hospitals only had medical translators available but they could be directly attended by the Myanmar doctors who speak the same language at the IP's clinic. However, it might not be feasible and sustainable to establish the IP's clinics at all implementation sites.

In addition to the free diagnosis and treatment, supplemental food and nutritional support provided by the Project was also highly appreciated by all of the patients interviewed, however, it is unclear if this kind of support contributed to the treatment success. Many patients mentioned that the food and nutritional support were helpful but it was insufficient to feed their families, especially when the patients were the head of the family and were the only source of the family income. For example, one of them stated that:

> "*It was very helpful that we also received some rice, eggs, cooking oil, and sometimes the milk every month. Actually, it's not enough but still better than nothing. I wanted to receive some more for my wife and my kids too since I couldn't work and we didn't have enough foods but I didn't dare to ask. I thought that's probably what they could give to us*".

(44 years old male, former patient)

14. Co-infections and Other Underlying Health Problems

As indicated in the treatment outcome section above, the patient death is one of the main reasons for unsuccessful treatment. More than half of the patients reported to be co-infected with the HIV, and this was accounted for about 50% of the total deaths reported from this Project. Besides the HIV co-infection, most of the death cases received the TB treatment while also had other serious health problems such as diabetes mellitus, hypertension, kidney disease, lung cancer, and about 15% were elderly patients. Only about 12% were deaths due to TB infection alone. While the deaths due to co-infections and other underlying causes might be difficult to avoid, some lives might have been prolonged if they received quality diagnosis and treatment earlier, as well as referral between different health programs.

15. Employers of Patients

While some DOT Partners raised the issue of the influence of the employers on the treatment outcomes in a negative way, i.e. fired the patients when they were sick, many interviewed patients on the other hand mentioned that their employers were very kind and supportive. Some of them said their employers were the ones who took them to the hospitals, while the others said their employers sometimes gave them some money and provided them with some food. Many patients could still live "on-site", at the dormitory provided by the employers in the back of their workplace.

RECOMMENDATIONS

Overall, the Project has demonstrated great success in case notification, case enrollment, and case management that were mainly up to international standard. However, there have always been rooms for improvement and lessons to be learned for future programming. According to this OR findings, in addition to the strategies, approaches, and activities that have already been well implemented by the Project, the following strategies and approaches are recommended, either to further strengthen the current project implementation or to develop similar projects for migrants at other locations. Most of the recommendations provided below can be addressed immediately with no or minimal extra budget, unless indicated otherwise.

1. Strengthening Monitoring of the Project's Outputs to Improve Data Use

Although this OR did not focus on the clinical aspect, some issues to be considered for future improvement of the Project were found. For examples, the reverse trends of the number of migrants screened and the TB cases identified should be taken into consideration whether or not the mass screening should be continued. The regular report of smear unknown cases among migrants form different project sites should be investigated and the root cause(s) identified should be presented to the National TB Program to identify ways to improve future implementations in a timely manner since this could affect the analysis and interpretation of the Project's results; which in turn could lead to inappropriate recommendations for future programming.

2. Enhancing Access to Health Care Services among Targeted Migrants

According to the interviews for this OR, the TB-RAM Project records, and findings from other projects addressing the health of migrants in Thailand; the constraint on obtaining cooperation to provide health care services to non-Thai populations in Thailand has largely been overcome. The findings from this OR also reported high treatment success rate and when the hard-to-avoid deaths such as HIV co-infected, elderly, and cases with other underlying health causes were excluded, the treatment success rate could be as high as over 93%. This can be implied that as long as the migrant patients can access TB diagnosis and treatment, it is very much likely that they will be completely treated and/or cured, and therefore, it is crucial to ensure that all migrant patients can access available health service. The key remaining challenges seem to be to ensure that those who are eligible for the services realize about their eligibility and access to the available services, and to ensure that as many ineligible patients receive support they need.

According to a study conducted by the International Organization for Migration (IOM) and WHO in 2009, the CMHIS was underutilized by the scheme members while most if not all of the government hospitals situated at the border towns had large amounts of deficits since the hospitals could not collect medical service fees from uninsured patients. From this OR findings, some migrant patients who were members of the CMHIS or the UC schemes did not utilize the schemes that they were entitled to due to their lack of knowledge on the schemes and this led to a long period of suffer and severe conditions before they seek health care and finally enrolled to the TB-RAM Project. It is likely that many other patients fall into this category, and therefore, the NGOs or community-based organizations (CBOs) that usually have more networks and access to migrant communities should promote this knowledge and

utilization of the schemes rather than just covering the health care costs for them. The more migrants brought into the public health systems, the more sustainable the health development of migrants would be. However, to ensure that the NGOs/CBOs receive credit, recognition, and the funding support required for so doing, migrant cases referred or facilitated to receive eligible health care services should be made part of agreed deliverables in the donor support projects. The saving from the health care costs for those who are eligible for the public health schemes could be utilized for more ineligible cases and/or other activities that are important for the project's success. Enhancing TB knowledge and facilitating access to eligible public health services by NGOs/CBOs can also be considered parts of a strengthened public-private mix strategy.

With high levels of TB-HIV co-infection in both Thailand[12] and Myanmar,[13] provider-initiated HIV counseling and testing should be made a routine service for all TB cases and vice versa. In Thailand, the antiretroviral treatment (ART) for HIV infection has been made available free of charge under the UC Scheme, in which some of the target population of this Project are entitled to as found during the interviews. For migrant HIV patients who are not members of the UC Scheme, the ART has been made available under a special project so-called "NAPHA-Extension". Most of the target areas of the TB-RAM Project are overlapping with the areas where the migrant HIV/AIDS project operates – also funded by the GFATM and other donors and implemented by the Ministry of Public Health, the IPs, and many other well-known NGOs/CBOs. Although the NAPHA-Extension Project may not be able to enroll more migrants for ART, a collective response from multi-stakeholders in the areas should be able to identify ways to support the patients. A critical part is that both government and non-government TB service providers are aware of relevant stakeholders and establish effective referral networks and mechanisms and try their best to ensure that as many lives are saved and the patient's suffer is minimized.

In the long run, providing free health services to all migrants is not an appropriate way to resolve the problem and care providers should not assume that all migrants cannot afford to pay for their health. The ideal situation to ensure health coverage for migrants is to ensure that all migrants can enroll in a certain type of health care coverage scheme, either supported by general tax revenue (like the UC) or a premium-based scheme (SSS and CMHIS), and either compulsory or voluntary. For the existing schemes, all migrants must be registered, which is unlikely to happen in the near future, and therefore, there is still a large number of migrants fall out of these scheme. To fill current gaps, some alternative mechanisms should be established such as a local mutual fund or trust fund as securing private sector resources is not an impossible task if they were to realize that healthy employees will ultimately improve their productivity and profit. The migrant health program reviewed by IOM found that many migrants were willing to join the CMHIS but they are not eligible due to their undocumented status. A combined contribution from local tripartite; local health offices and facilities, employers of migrants, and the migrants themselves should be sufficient to support their health care cost, either partially or in full. Although potentially difficult to manage and requiring a thorough analysis, an additional alternative is to allow provincial health offices to provide health insurance at full cost to irregular migrants: e.g. waiving registration

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[12] 77% of TB patients with known HIV status and 16% of tested TB patients that are HIV positive in 2010 (WHO Tuberculosis Profile 2010 – Thailand)

[13] 3% of TB patients with known HIV status and 22% of tested TB patients that are HIV positive in 2010. (WHO Tuberculosis Profile 2010 – Myanmar). The percentage of TB patients with known HIV status is very low because HIV counseling and testing service is largely unavailable in Myanmar. (*the author – N Jitthai*)

requirements with the Ministry of Labour and Social Welfare; encouraging employers to purchase CMHIS on behalf of the migrants if they cannot afford to pay the premium; allowing NGOs/CBOs to purchase CMHIS for their target migrants; and allowing NGO clinics to be part of the pool of service providers under this scheme. This, however, will require a policy support from the health authority at the central level. In fact, if a sufficient number of migrants join the scheme and funds from the collected revenue are properly managed, it is anticipated that local health offices will gain some profit from the scheme, according to evidence from a study on financing health care for migrants in Thailand. Nonetheless, local health offices/ facilities would still be required to continue some level of financial commitment to health expenditure. This is particularly useful and politically more justifiable among services of public utility whose benefits impact directly on the Thai population and subsequently does not require a large budget, such as free diagnosis and treatment of a highly infectious disease like TB. Migrants without health insurance should contribute to health care costs, either in part or full according to their ability to pay, not according to services utilized. This will not only help subsidize uncollected health care expenditure but will also encourage migrants to take responsibility of their own health.[14,15]

In addition to the campaign on migrant rights to health to promote access among eligible migrants that can be conducted immediately with no/small cost as mentioned earlier, a longer term strategy recommended here is to conduct additional studies to explore how best to enhance migrants' access to health service and how best to address migrant health issue in a more sustainable way. For example, studies on modalities for local migrant health funds should be conducted and the locales with higher feasibilities and potential success (e.g. large enough number of migrants and supportive environment from stakeholders) should be piloted.

3. Promoting Meaningful Involvement of Migrants

Meaningful involvement of migrants is essential to ensure the success of a project and this has been proved to be effective in many other projects as well since they understand the migrant languages, cultures, and communities very well. One of the strategies of the TB-RAM Project to involve migrants as the Volunteer DOT Partners is technically sounded. However, involving migrants in a meaningful way to ensure that their contributions are maximized and effective for the project implementation requires in-depth technical knowledge and efficient management skills, as well as a long-term capacity enhancement plan and implementation. A systematic capacity building strategy and standardized contents and modules are essential to ensure that knowledge of volunteers with different, but mostly low, education background and experiences is fine-tuned; and skills can be mastered to deliver the essential services. Only trained and qualified volunteers should be accredited and given certain level of responsibilities. These are not only to empower them as community care takers but also to increase recognition as well as confidence among migrant patients and communities towards the volunteers. In addition, this can avoid advert outcomes to the Project from poorly trained or unskilled volunteers. Migrant volunteers should be systematically recruited (e.g. has a set of minimum requirements of their qualification and give priority to those who are relatively static or less mobile and more senior, etc.), trained, and retrained to ensure their competencies and a continuity of the services. Resources should be allocated for continuous process of the volunteer's capacity building throughout the

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[14] Nigoon Jitthai, 2009.
[15] Samrit Srithamrongsawat, et al., 2009.

implementation period. In a short run, the Project should look into existing training modules for migrant health workers and volunteers systematically developed and drown upon a long experience addressing migrant health issues in Thailand in the past decade by some NGOs such as the International Rescue Committee and the Raks Thai Foundation. Although these modules are not TB-specific, the contents and methodologies can be applied to TB project.

4. Strengthening Strategic Behavior Change Interventions

From the project record, about one-third of migrant patients enrolled were referred to the Project by health facilities in the target areas; reflecting that many migrants were aware of available health care services. However, it is more important for one's livelihood and well-being to prevent diseases rather than to receive treatment after developing illness; and once ill, one should seek health care sooner rather than later. It has also been proven that prevention has more cost-benefit than treatment, while disabilities can be minimized and quality of life can be maximized if the patients seek care early. Therefore, the migrant health service should not only limit to clinical services for medical diagnosis and treatment. In the case of TB, while environmental factors have to be considered and often require significant long-term investment to improve infrastructure such as improving the extremely overcrowded living condition in migrant communities, many behavior-driven concerns can be tackled immediately with minimal cost. In general, basic health prevention and promotion activities, including health information dissemination, do not require a large and/or extra budget but rather the techniques and skillful staffs. It is very important that migrants are equipped with knowledge and empowered to take charge of their self and community health through positive behavior change. Myths and misperceptions on TB (especially that TB is not infectious, incurable, and all TB patients must cough) should be combatted to enhance the treatment literacy, quality, and outcome; as well as to avoid further spread of the disease in families and communities. Families of patients and communities, including employers and house owners, should also be educated so that they have mutual understanding as the patients, and do not provide misperceptions and/or contradict information to the patients.

5. Establishing and/or Strengthening Self-help Group

Self-help group of migrant TB patients implemented in Ranong was reported to be an effective means for enhancing treatment literacy and psychosocial support among migrant patients. Unfortunately, this peer-support strategy is not implemented in all targeted sites and the quality or effectiveness of the implementation in other sites was not assessed due to the time and budget constraints for this research. However, in general, the peer-support strategy has proven to be an effective strategy and has been implemented widely for many health issues such as for withdrawal of alcohol and/or subsistence dependence, persons living with HIV/AIDS, diabetic patients, and youth counseling. While this peer-support strategy is highly recommended also for migrant TB patients, this should be implemented with care since it requires well-organized approaches, settings, tools, materials, and schedules, as well as highly skilled facilitators. A poorly organized SHG session with a poor skilled facilitator can lead to adverse outcomes such as lack of sense of belonging and sharing among participants, confusing information obtained, discouraging instead of encouraging members to stay on treatment, and so on.

6. Creating Innovative Means for Case Follow-up and Enhancing Treatment Literacy among Patients and Families

Although the overall default rate reported by the Project was lower than 5% as recommended by WHO, a detail analysis of the default cases suggested that many default patients may have carried drug resistant TB with them since most of them (over 70%) were loss-to-follow-up after had been on treatment for two or more months. Another concern is that about one-quarter of the default cases had been on treatment for longer than five months, including over 17% who had been on treatment for six or more months, but had not been diagnosed as completed or cured. The actual causes for defaulting were unclear but it may be possible that the general information and knowledge that the basic TB treatment requires about six months to complete were acquired among patients but not the actual treatment literacy; resulting in many default cases after five to six months of treatment. This is really unfortunate since those who were actually cured or completed cases missed an opportunity to be diagnosed and confirmed as cured or completed cases; while on the other hand, those who had been on treatment for some time might have carried drug resistant TB with them. Although the causes of default were unclear, enhancing not only TB knowledge but the treatment literacy among patients and families should be conducted and this can be done immediately with current and future patients without additional cost. As well, creating innovative means for case follow-up such as adopting the community surveillance and rapid response system for disease outbreaks through enhancing migrant networks in communities to monitor patients' movement and report to the Project Staff or volunteers should be helpful to further reduce default cases. In addition, volunteers should be trained on safe mobility so that they can understand migration context and be more influent to their peers to support the migration of patients after their treatments were adhered to.

Special attention should be paid on the provinces that reported lower treatment success rates than WHO's recommendation, i.e. Tak and Kanchanaburi. A more thorough analysis of the situation in these provinces should be conducted to determine factors contributing to much lower success rates and ways to address them. From this research, it is recommended that facility-based service must always been supplemented by a strong community intervention and case follow-up. DOT providers should not feel relax towards the fifth/sixth month of treatment but rather to ensure that the patients, families and/or other supporters understand that it is important to obtain confirmation from the doctor that they actually completed the treatment or cured from TB to avoid defaulting of potential drug resistant cases. More attention should also be paid on the patients with treatment failure to ensure that the cases are continuously and appropriately managed to avoid further spread of drug resistant TB.

The fact that about 56% of the default cases could be traced from community members and reported that they returned to Myanmar suggests that it could be possible that some of the patients in border towns other than Sangkhlaburi were actually cross-border patients but they failed to report correct information due to fear of arrest or that they would not be able to receive treatment. Initiatives to strengthen cross-border collaboration are important and need to be encouraged since it is less likely that the cross-border patients seeking healthcare in Thailand can be avoided. A more in-depth analysis of the volume and potential treatment success among cross-border patients should be systematically conducted. The Joint Action Plan for cross-border collaboration between Thailand and Myanmar[16] has been an ongoing challenge since the turn of the millennium in term of translating the agreement into actual

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[16] Signed by both parties in July 2000.

implementation. However, the recent political shift in Myanmar that demonstrates a more democracy situation may open up for revitalization of this agreement. In whatever capacity or extent possible, this could potentially include joint problem-solving, troubleshooting, and sharing of epidemiological data and tools (e.g. data collection forms, health cards, treatment follow-up registration forms, etc.) as well as health education materials in a short run, and perhaps a harmonized treatment protocol (as the National Malaria Program on both sides have achieved) in the long run. It would be optimal if all such contacts are coordinated closely between the MOPH in both countries. WHO, IOM, World Vision Foundation, all have a strong presence in both countries; and WHO and IOM with a mandate to push forward the World Health Resolution on the Health of Migrants endorsed at the World Health Assembly in 2008, perhaps could play a key role in facilitating this collaboration with support from relevant partner agencies. For all these to come alive, a long-term commitment of relevant parties and policy support are required.

Nonetheless, it is important to note that cross-border collaboration is not the only action that can be taken for a meaningful longer-term impact on health care access among migrants. Cross-border collaboration does not necessarily interfere with sharing information or patient referrals. The major source communities of labour migrants in Myanmar are quite well known. It is not difficult to identify potential migrants and families of migrants who remain at source communities and educate them about safe mobility, migration and related health risks. Alternatively, if there are too many source communities and it is too difficult to target activities on safe mobility and migration health education to specific locations and population groups, a campaign at national level for general populations should be considered since many of them will sooner or later become migrants, internally or internationally.

It is also important to note that a key reason for cross-border patients seeking health care in Thailand is that the health infrastructure and services are insufficient in their home country, and therefore, improving health infrastructure and health service systems in Myanmar may improve the situation. It is important for Thai and Myanmar governments to work hand in hand to bridge service gaps on both sides of the border to improve the situation. Several donors could be approached for funding support to strengthen infrastructure and systems in Myanmar while Thailand can provide technical support to the health workforce of its neighbor, especially through a series of training and field exchange visits.

7. Balancing Demands and Supplies for Different Types of TB Services

As found in this OR results, the numbers of migrants screened were dramatically increased in Year II and Year III and stood at about the same level in Year IV, while the case notification rates were much higher in the Year I and Year II as compared to Year III and IV. Assuming that the screening quality was up to standard with no or very few missing cases, this could be implied that a mass screening of migrants might not be necessary for TB control in the targeted areas at least for the next few years, unless some unpredictable phenomenon such as a large influx of new group of migrants into the areas took place. As also seen from this OR results, while the numbers of migrant patients enrolled increased in Year II, the treatment success rates also increased along with the numbers of Project staff. In Year III, the numbers of migrant patients enrolled were not much different than Year II but the treatment success rates were visibly dropped along with the number of Project staff. These reflected the Project's success in term of creating demands for the services, but on the other hand, a challenge on keeping up with the implementation that might be overloaded due to unbalanced demands and supplies. Implementation and human resource management of the Project

should be revisited and modifications should be made as deemed appropriate.

Considering the long term sustainability of the migrant health workers and volunteers who play a vital role in reaching out to target migrants, several approaches could be implemented. Since 2009, the Ministry of Labour and Social Welfare allows migrants to be officially hired by health NGOs/CBOs, and therefore, funds mobilized from various sources can be utilized for this purpose. In addition, the Ministry of Public Health also allows health authorities/ facilities to hire migrants to join the health workforce. Relevant authorities/ facilities may use the health prevention and promotion budget allocated from the CMHIS to hire migrant health workers/ volunteers. Alternatively, some provinces utilize the surplus from regular service fee collected from self-paid patients and/or other sources such as donations to do so. Unfortunately, these practices are not being implemented across the board but rather in small number of provinces with high concentration of migrant population. It is important to for both the MOPH and NGOs/CBOs to ensure that relevant authorities/ staff are aware of these supportive policies and advocate for more involvement of migrants in solving their own community health issue.

CONCLUSION

Although the data on estimates of TB burden, i.e. mortality and morbidity rates, among migrants in Thailand is not available, the case notification data from this Project suggests that the level of TB problem among migrants may be similar to that of the Thai population but the type of problem might not be identical according to the differences in detailed breakdowns of new and retreatment cases found among Thai and migrant populations. Overall, the Project has demonstrated great success in terms of migrant TB case notification, enrollment, and treatment of all TB cases. The Project is also well recognized and valued by both government and non-government stakeholders as well as the patients and targeted communities. Further strengthening the implementation management, especially enhancing diagnosis, treatment and recording according to the national protocol; enhancing access to available health services among migrants; strategic behavior change interventions and treatment literacy among patients and communities in selected sites with low success rates could lead to an even greater success of the Project.

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ANNEXES

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