Time to unsuccessful tuberculosis treatment outcome, Cambodia, China, and Viet Nam

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Objective: To determine the frequency and characteristics of patients with unsuccessful tuberculosis (TB) treatment.

Methods: Random selection of TB case registers among all treatment units in Cambodia, two provinces in China, and Viet Nam. The data of two calendar years were analyzed to assess unsuccessful outcomes and their time of occurrence.

Results: Among the 33 309 TB patients, treatment was unsuccessful in respectively 10.1%, 3.0% and 9.1% of patients in Cambodia, China and Viet Nam. The risk of death was highest in Cambodia, higher among males than females, increased with age, and was more common among retreatment cases than new cases, and among patients with a high than a low sputum smear microscopy grade. Half of all deaths occurred in the first 2 months in Cambodia and within 11 weeks in China and Viet Nam. Median time to default was 3 months in Cambodia and Viet Nam, and about 2 months in China.

Conclusions: Treatment was highly successful in the three study countries, with a low proportion of death and default. As the majority of defaulting occurs at the beginning of treatment, all countries should critically review their current policy of treatment support in this period.

The Western Pacific Region of the World Health Organization (WHO) accounted for 21% of the estimated global tuberculosis (TB) incidence in 2007. Cambodia, China and Viet Nam, all in the Western Pacific Region, rank respectively twenty-first, second and twelfth among the 22 high-burden countries.[1] The WHO TB control strategy is based on early case finding and ensuring that those patients who are diagnosed are successfully treated.[1] Reasons for lack of success include premature death, loss to follow-up, transfer to another jurisdiction without feedback, and treatment failure. Information on predisposing factors and when these events occur is limited.

An extract of essential data is abstracted from the TB case register and reported to the WHO in aggregate form, summarizing results on case finding and treatment outcome. As data are abstracted manually in most countries, including the three study countries, aggregate data provide limited information. Standard information for the case register is detailed in the tuberculosis guide of the International Union Against Tuberculosis and Lung Disease (The Union).[2]

To optimize service delivery, programs should focus on patients with an unsuccessful treatment outcome. To allow a more detailed analysis of factors associated with unsuccessful outcome, we embarked on a study using individually captured electronic data. To this end, we collected a representative sample of TB case registers by cluster sampling from Cambodia, two provinces in China, and Viet Nam to determine, in addition to the frequency of unsuccessful outcomes, the characteristics of these patients, and to ascertain at what point in time such outcomes occurred.

METHODS

Study sites

Cambodia, the Hubei and Jiangsu Provinces in China, and Viet Nam were selected as the three study jurisdictions. These three neighboring countries had gross domestic products of respectively 405, 1490 and 558 USD per capita in 2004. At the time of the study, a 6-month regimen was used in the two provinces of China and an 8-month regimen in Cambodia and Viet Nam, with some units transiting from the 8- to the 6-month regimen.

Sampling

A representative sample of TB case registers was collected as reported previously.[3] Briefly, for Cambodia and Viet Nam, 30 TB management units were randomly selected from the total of respectively 140 and 668 units. In China, 30 management units were selected from the total of 175 units in the two provinces of Hubei and Jiangsu. From each selected unit, the TB case register was obtained and data from two full calendar years were captured: 2003 and 2004 in Cambodia, and 2004 and 2005 in China and Viet Nam.

Variables and data entry

In the TB case register, each patient is assigned one line and given an identifier that is unique for the treatment unit and the year. Basic demographic information (age and sex) and information relating to diagnosis and treatment (site of disease, category of patient, date treatment started, and initial regimen) is recorded on the left-hand site of the register. The right-hand side captures information on initial and follow-up bacteriologic findings and treatment outcome. All variables except patient name, address and remarks were captured.

The electronic data collection instrument was prepared using EpiData Entry (Version 3.1, freely available at http://www.epidata.dk, EpiData Association, Odense, Denmark), as previously reported.[3] Data were double-entered and validated for any discordance by comparing the discordant values between the pair members of the putatively identical files against the original physical case register. Corrections of any errors were made in a final analysis file.

Data analysis

Data analysis was performed using EpiData Analysis (Version 2.2, http://www.epidata.dk). For categorical variables, proportions with 95% confidence intervals (CIs) were used to describe treatment outcome. The relative risks (with 95%CI) of death or defaulting by patient characteristics were determined. Unsuccessful outcome probability by month of treatment was determined by the Kaplan-Meier method, using the interval between treatment start and end.

New cases were those patients classified as new in the patient category field; retreatment cases were those classified as relapse, treatment after failure, or treatment after default. Patients recorded as transfer in, others, and those with no information recorded, were not classified in the treatment category and were not reportable. These patients were excluded from the analysis.

The six possible treatment outcomes, i.e., cure, treatment completed, treatment failure, death, default, and transfer out, were defined according to the revised international definitions in TB control.[4] Treatment success included patients who were cured or completed treatment. Unsuccessful treatment was defined as a patient classified as having failed treatment, defaulted, died of any cause or transferred out while on treatment.

Study approval

Due to the retrospective, record-based nature of the study and patient anonymity, each country required only administrative approval, as reported previously.[3] Ethics approval for the study was obtained from The Union's Ethics Advisory Group.

RESULTS

The database comprised 37 635 records, of which 3447 (9.2%) belonging to the non-reportable categories 'transfer in' or 'other' were excluded. Of the remaining 34 188, 387 (1.1%) had a non-standard treatment outcome (all from China), and 492 (1.4%) had no outcome recorded. These 879 were also excluded, leaving 33 309 patient records (97.4% of the 34 188 reportable cases) for analysis.

Patients and overall treatment outcome

Of the 33 309 patients, 4036 (12.1%) were from Cambodia, 22 372 (67.2%) from the two provinces of Hubei and Jiangsu in China, and 6901 (20.7%) from Viet Nam (Table 1). The age distribution of the patients was similar in all three countries, with medians ranging from 44 to 47 years. Males predominated in all three countries, with ratios of 1.1, 2.4, and 2.2 respectively in Cambodia, China, and Viet Nam.

Treatment outcome was unsuccessful in 10.1% (95%CI 9.2–11.0) of patients in Cambodia, 3.0% (95%CI 2.8–3.3) in the two provinces of China, and 9.1% (95%CI 8.4–9.8) in Viet Nam (Table 1). Treatment failures were most frequent in Viet Nam, while default, death and transfer out were most frequent in Cambodia.

Factors associated with default

In univariate analysis, default was considerably more frequent in Cambodia than in the other two countries. Significant associations with default were found with older age, extra-pulmonary TB

TABLE 1 Frequency of unsuccessful treatment outcome by patient characteristic, 2-year period, Cambodia 2003–2004, China (Hubei and Jiangsu Provinces) 2004–2005, and Viet Nam 2004–2005

	Total		Unsuccessful outcome			Failure			Default			Death			Transfer out		
	n	Col %	n	Row %	95%CI	n	Row %	95%CI	n	Row %	95%CI	n	Row %	95%CI	n	Row %	95%CI
Total	33 309	100.0	1711	5.1	4.9–5.4	239	0.7	0.6–0.8	263	0.8	0.7–0.9	681	2.0	1.9–2.2	528	1.6	1.5–1.7
Country																	
Cambodia	4036	12.1	406	10.1	9.2–11.0	9	0.2	0.1–0.4	65	1.6	1.3–2.0	187	4.6	4.0–5.3	145	3.6	3.1–4.2
China	22 372	67.2	680	3.0	2.8–3.3	127	0.6	0.5–0.7	103	0.5	0.4–0.6	231	1.0	0.9–1.2	219	1.0	0.9–1.1
Viet Nam	6901	20.7	625	9.1	8.4–9.8	103	1.5	1.2–1.8	95	1.4	1.1–1.7	263	3.8	3.4–4.3	164	2.4	2.0–2.8
Sex																	
Female	10 469	31.4	490	4.7	4.3–5.1	60	0.6	0.4–0.7	89	0.9	0.7–1.0	166	1.6	1.4–1.8	175	1.7	1.4–1.9
Male	22 833	68.5	1220	5.3	5.1–5.6	179	0.8	0.7–0.9	174	0.8	0.7–0.9	515	2.3	2.1–2.5	352	1.5	1.4–1.7
No sex recorded	7	0.0	1	14.3	2.6–51.3	0	0	—	0	0	—	0	0	—	1	14.3	2.6–51.3
Age group, years																	
0–4	40	0.1	1	2.5	0.4–12.9	0	0	—	1	2.5	0.4–12.9	0	0	—	0	0	—
5–14	290	0.9	5	1.7	0.7–4.0	0	0	—	1	0.3	0.1–1.9	2	0.7	0.2–2.5	2	0.7	0.2–2.5
15–24	4372	13.1	153	3.5	3.0–4.1	15	0.3	0.2–0.6	23	0.5	0.4–0.8	27	0.6	0.4–0.9	88	2.0	1.6–2.5
25–34	5259	15.8	307	5.8	5.2–6.5	29	0.6	0.4–0.8	48	0.9	0.7–1.2	105	2.0	1.7–2.4	125	2.4	2.0–2.8
35–44	5865	17.6	303	5.2	4.6–5.8	55	0.9	0.7–1.2	50	0.9	0.6–1.1	101	1.7	1.4–2.1	97	1.7	1.4–2.0
45–54	5807	17.4	276	4.8	4.2–5.3	52	0.9	0.7–1.2	50	0.9	0.7–1.1	90	1.5	1.3–1.9	84	1.4	1.2–1.8
55–64	5048	15.2	235	4.7	4.1–5.3	42	0.8	0.6–1.1	36	0.7	0.5–1.0	101	2.0	1.6–2.4	56	1.1	0.9–1.4
≥65	6625	19.9	429	6.5	5.9–7.1	46	0.7	0.5–0.9	54	0.8	0.6–1.1	254	3.8	3.4–4.3	75	1.1	0.9–1.4
No age recorded	3	0.0	2	66.7	20.8–93.9	0	0	—	0	0	—	1	33.3	6.1–79.2	1	33.3	6.1–79.2
Disease site																	
Pulmonary	31 204	93.7	1516	4.9	4.6–5.1	239	0.8	0.7–0.9	239	0.8	0.7–0.9	588	1.9	1.7–2.0	450	1.4	1.3–1.6
Extra-pulmonary	2105	6.3	195	9.3	8.1–10.6	0	0	—	24	1.1	0.8–1.7	93	4.4	3.6–5.4	78	3.7	3.0–4.6
Microscopy diagnosis																	
Smear-positive	24 564	73.7	1240	5	4.8–5.3	237	1.0	0.9–1.1	189	0.8	0.7–0.9	479	2.0	1.8–2.1	335	1.4	1.2–1.5
Smear-negative	7001	21.0	294	4.2	3.8–4.7	2	0.0	0.0–0.1	53	0.8	0.6–1.0	120	1.7	1.4–2.0	119	1.7	1.4–2.0
Not recorded	1744	5.2	177	10.1	8.8–11.7	0	0	—	21	1.2	0.8–1.8	82	4.7	3.8–5.8	74	4.2	3.4–5.3
Treatment category																	
New cases	30 265	90.9	1426	4.7	4.5–5.0	153	0.5	0.4–0.6	233	0.8	0.7–0.9	567	1.9	1.7–2.0	473	1.6	1.4–1.7
Retreatment cases	2558	7.7	242	9.5	8.4–10.7	86	3.4	2.7–4.1	25	1.0	0.7–1.4	95	3.7	3.0–4.5	36	1.4	1.0–1.9
Not classified	486	1.5	43	8.8	6.6–11.7	0	0	—	5	1.0	0.4–2.4	19	3.9	2.5–6.0	19	3.9	2.5–6.0

CI = confidence interval.

TABLE 2 Risk of default or death by patient characteristic, 2-year period, Cambodia 2003–2004, China (Hubei and Jiangsu Provinces) 2004–2005, and Viet Nam 2004–2005

Characteristic	Total	Default		Death	
		n (%)	RR (95%CI)	n (%)	RR (95%CI)
Total	33 309	263 (0.79)		681 (2.04)	
Country					
Cambodia	4 036	65 (1.61)	1	187 (4.63)	1
China	22 372	103 (0.46)	0.29 (0.25–0.32)	231 (1.03)	0.22 (0.21–0.23)
Vietnam	6 901	95 (1.38)	0.85 (0.82–0.89)	263 (3.81)	0.82 (0.75–0.91)
Sex					
Female	10 469	89 (0.85)	1	166 (1.59)	1
Male	22 833	174 (0.76)	0.89 (0.85–0.94)	515 (2.26)	1.42 (1.40–1.44)
*Male, adj 1**	33 301	263 (0.79)	0.97 (0.75–1.26)	680 (2.04)	1.57 (1.31–1.88)
Age, years					
0–24	4 702	25 (0.53)	1	29 (0.62)	1
25–45	16 931	148 (0.87)	1.64 (1.48–1.82)	296 (1.75)	2.83 (2.43–3.31)
≥55	11 676	90 (0.77)	1.45 (1.13–1.86)	356 (3.05)	4.94 (4.21–5.80)
25 to 45 years, adj 2†	21 628	173 (0.80)	1.06 (0.77–1.46)	325 (1.50)	1.74 (1.34–2.25)
≥55 years, adj 2†	16 373	115 (0.70)	1.05 (0.71–1.55)	384 (2.35)	1.84 (1.52–2.23)
Site					
Pulmonary	31 204	239 (0.77)	1	588 (1.88)	1
Extra-pulmonary	2 105	24 (1.14)	1.49 (1.21–1.83)	93 (4.42)	2.34 (2.19–2.51)
Extra-pulmonary, adj 3‡	10 935	160 (1.46)	0.82 (0.53–1.26)	450 (4.12)	1.33 (1.06–1.66)
Microscopy					
Smear-negative	7 001	53 (0.76)	1	120 (1.71)	1
Smear-positive	24 564	189 (0.77)	1.02 (0.94–1.10)	479 (1.95)	1.14 (1.1–1.17)
Scanty or 1+ positive	13 491	113 (0.84)	1	240 (1.78)	1
2+ positive	6 954	41 (0.59)	0.70 (0.63–0.79)	104 (1.50)	0.84 (0.80–0.89)
3+ positive	3 559	32 (0.90)	1.07 (0.84–1.36)	119 (3.34)	1.88 (1.69–2.09)
Not quantified	560	3 (0.54)	0.64 (0.20–2.01)	16 (2.86)	1.61 (0.98–2.65)
2+ positive, adj 4§	20 432	153 (0.75)	0.74 (0.52–1.06)	344 (1.68)	0.88 (0.70–1.11)
3+ positive, adj 4§	17 040	144 (0.85)	0.96 (0.65–1.43)	359 (2.11)	1.60 (1.29–1.98)
Treatment history					
New	30 265	233 (0.77)	1	567 (1.87)	1
Retreatment	2 558	25 (0.98)	1.27 (1.09–1.47)	95 (3.71)	1.98 (1.89–2.07)
Retreatment, adj 5¶	32 558	258 (0.79)	1.31 (0.87–1.98)	662 (2.03)	2.03 (1.64–2.51)

*Adj 1: relative to females, adjusted for country and age. Persons with missing information excluded.
†Adj 2: relative to those aged 0–24 years, adjusted for country and sex. Persons with missing information excluded.
‡Adj 3: relative to pulmonary TB patients, adjusted for country and sex, excluding China. Persons with missing information excluded.
§Adj 4: relative to scanty or 1+ positive among pulmonary TB patients only, adjusted for country and sex. Persons with missing information excluded.
¶Adj 5: relative to new cases, adjusted for country and sex. Persons with missing information excluded.

and being a retreatment case (Table 2). Due to the imbalance in numbers and the observed sex differences between countries, an adjustment was made for these factors. After adjustment for country and age, male sex no longer appeared protective against default, as suggested in the univariate analysis. Stratifying default by sex and adjusting for country, those aged >24 years were not at increased risk of default compared to the youngest age group. In China, only 1.1% of all cases were recorded as extra-pulmonary, while in Cambodia and Viet Nam these represented 18.3% to 16.1% of cases. Cases from China were thus excluded from the stratified analysis. After adjusting for country and sex, having extra-pulmonary TB was no longer a risk factor for default. In summary, none of the factors identified in univariate analysis remained following adjustments by stratification.

Factors associated with death

In univariate analysis, the risk of death was lowest in China, higher among males than females, increased with age, was more common among patients with a high than a low sputum smear microscopy grade, and was more common among retreatment than in new cases. Males were at higher risk of death than females. Adjustment for country and age pronounced it further.

In Cambodia, the mean age among patients with a successful outcome was similar to that among patients who died (44.7 vs. 46.3 years). In China, the difference was large and significant, at respectively 46.3 and 63.1 years. In Viet Nam, the difference was small yet significant, at respectively 46.5 and 52.9 years. Increasing age was associated with an increased risk of death in univariate analysis, and while adjustment showed a weaker association, older age remained a risk factor for death.

The increased risk of death among patients with extra-pulmonary TB compared to those with pulmonary TB remained after adjustment for sex and country (excluding China from the analysis). Adding age to the stratification increased the risk further, but remained difficult to interpret given many empty strata (data not shown).

A high sputum smear microscopy grade (3+ positive) was associated with an increased risk of death, which remained after adjusting for country and sex. Retreatment was a risk factor for death on both univariate and adjusted analysis.

Treatment duration until unsuccessful outcome

As the standard treatment duration differed by country, transfer, death, and default from treatment were compared within
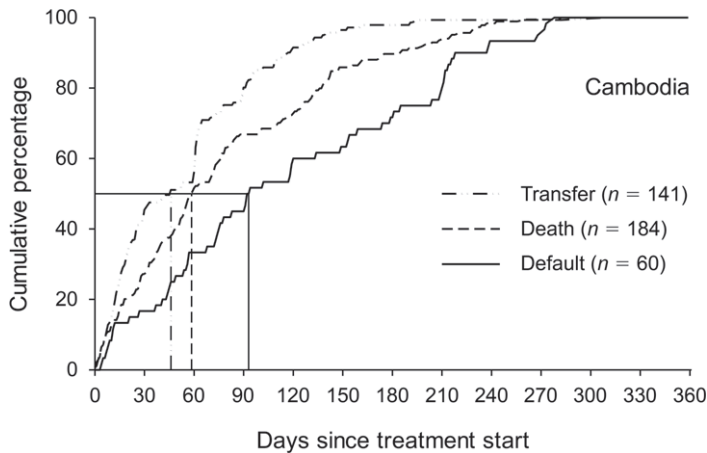
FIGURE 1   Cumulative proportions of default, transfer out and death, Cambodia, 2003–2004. Thin horizontal line = median; vertical lines = three event points on time axis.
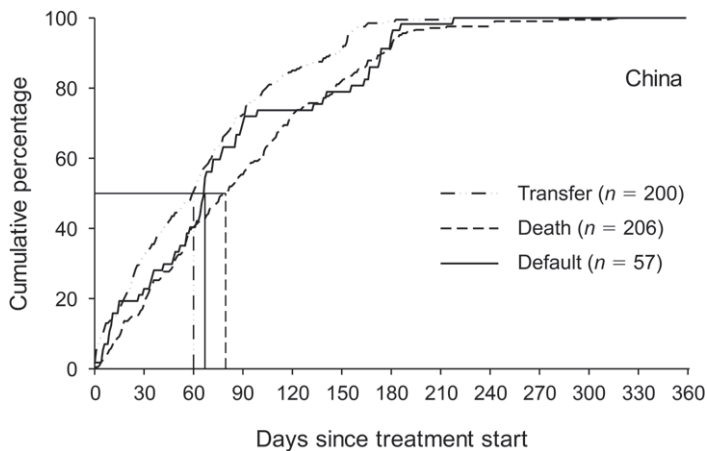

FIGURE 2   Cumulative proportions of default, transfer out and death, China (Hubei and Jiangsu Provinces), 2004–2005. Thin horizontal line = median; vertical lines = three event points on time axis.
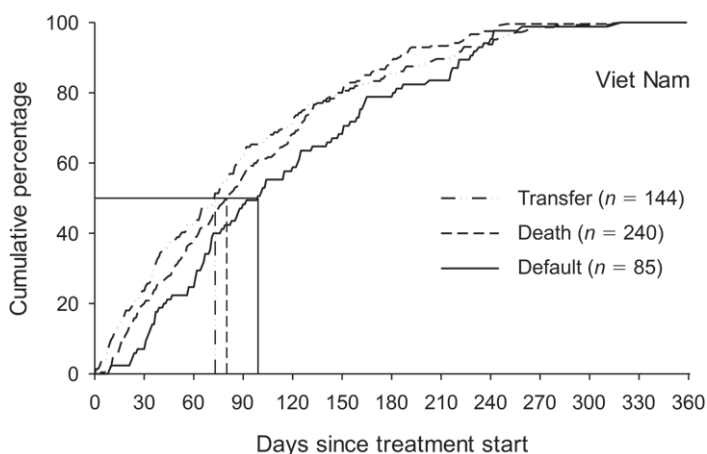

FIGURE 3   Cumulative proportions of default, transfer out and death, Viet Nam, 2004–2005. Thin horizontal line = median; vertical lines = three event points on time axis.

each country (Figures 1–3). As patients may be treated for longer than minimally required, the observation time was terminated at 1 year. Using largely an 8-month regimen, the medians for the three events were far apart and the means differed significantly in Cambodia (Figure 1). It is of note that half of all deaths occurred within the first 2 months, and half of the defaults within 3 months.

In China (Figure 2), using largely a 6-month regimen, the medians were close together and the 95%CIs of the means of default and death overlapped. While default was expected to occur earlier due to the shorter treatment regimen, it is of note that the median time to death was 21 days later than in Cambodia.

In Viet Nam (Figure 3), using largely an 8-month regimen, the medians for the three events were also relatively close together, and the 95%CIs of the means of all three events overlapped. While the median time to default was almost the same as in Cambodia (just over 3 months) using the same treatment duration, the median time to death was substantially later (80 days) than in Cambodia, and virtually identical to China (79.5 days).

Probability of any unsuccessful treatment outcome

Figure 4 shows the probability of any unsuccessful outcome among new smear-positive cases by month of treatment course. Bracketing the interval into 30-day periods, the Kaplan-Meier probability of an unsuccessful outcome was highest in Cambodia, followed by Viet Nam and then China at any month after treatment initiation. After 330 days, the probability remained the same; the probability of an unsuccessful outcome was significantly lower in China than in Cambodia, but did not differ in the case of China and Viet Nam or Cambodia and Viet Nam.

Probability of default from treatment in the three countries

To control for the different treatment durations in the three countries, we limited this analysis to patients with new sputum smear-positive TB who were known to have received a standard 6-month regimen in China or an 8-month regimen in Cambodia and Viet Nam. Irrespective of the regimen, the observation period was stopped after 180 days to allow for comparison (Figure 5). The median time to default was similar in all three countries, and the means did not differ significantly.
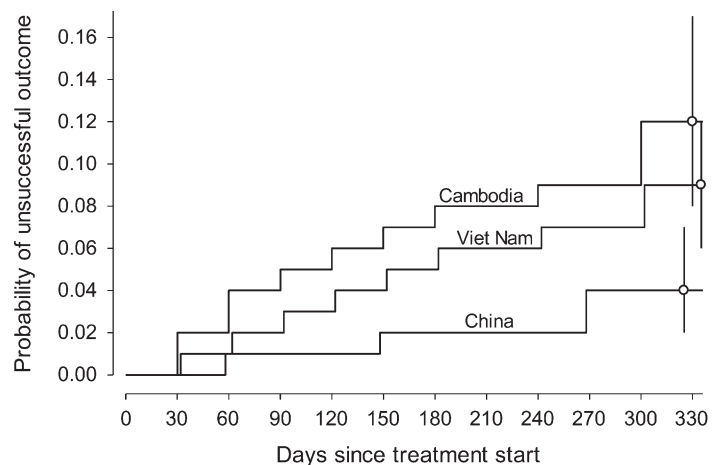

FIGURE 4   Kaplan-Meier probability of unsuccessful outcome among new smear-positive cases, by month of treatment and by country, Cambodia, China (Hubei and Jiangsu Provinces), and Viet Nam, 2003–2005.
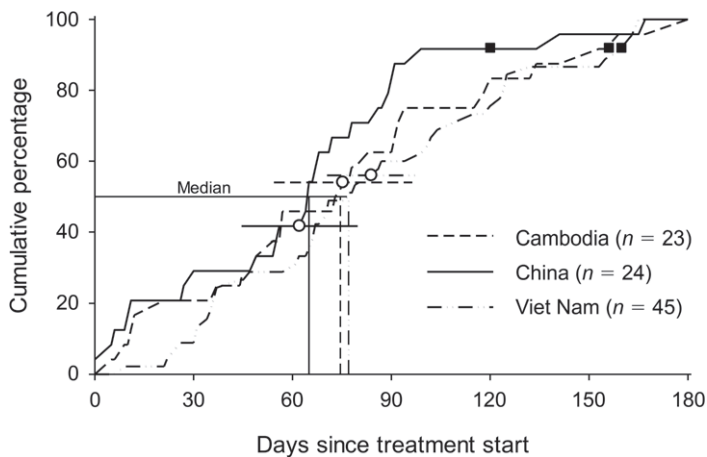
FIGURE 5 Comparative cumulative frequency of default among new sputum smear-positive cases, among patients on a standard 6-month regimen (Hubei and Jiangsu Provinces in China), or a standard 8-month regimen (Cambodia and Viet Nam). Observation time limited to first 180 days after treatment start. Vertical lines = median time points of default; circles with horizontal lines = means with 95% confidence intervals; filled squares = 90th percentiles.

DISCUSSION

We assessed treatment outcome and timing of unsuccessful outcomes in Cambodia, two provinces in China, and Viet Nam, three settings with more than 90% treatment success, higher than in many other settings.[5–10] With an improvement in the epidemiological situation, the age of TB patients is expected to increase.[11] Despite differences in the epidemiological situation in the three countries,[12–14] the mean age of the patients was nevertheless remarkably similar, at about 45 years.

We found treatment default to be around 1%, much lower than reported in other studies.[5,6,8,9,15–17] A multitude of factors predicting default has been reported, often differing from one setting to the other.[6,18–21] In line with other studies,[18,22] we found a greater tendency (although not significant after adjustment for various factors) for patients with a prior history of treatment to default. Default might often be grossly underestimated, as patients who are diagnosed with sputum smear-positive TB may never be registered, depending, perhaps, on whether programs follow the WHO Handbook literally to register only patients who receive treatment,[23] or The Union's recommendation that all diagnosed patients be registered, irrespective of whether or not they received treatment.[24]

Among new smear-positive cases, the median interval to default ranged from about 2 to over 3 months in the three countries. Controlling for treatment duration, half of all defaulting in all three countries had accumulated by around 10 weeks into treatment.

We found five factors to be associated with an increased risk of death while on treatment: older age, male sex, having extra-pulmonary TB, a high diagnostic sputum smear grade, and having a history of prior treatment. Age at death may be influenced by human immunodeficiency virus (HIV) infection. According to the report of the 2003 National HIV Seroprevalence Survey in Cambodia, HIV prevalence among TB patients was estimated at 11.8%.[12] The WHO estimated HIV prevalence among TB patients to be respectively 1.9% and 8.1% in China and Viet Nam.[1] Case fatality is also influenced by the extent of disease, to which delays in diagnosis and treatment would contribute.[25] The median time to death in Cambodia shows that more than half of deaths occurred dur-

ing the first 2 months of treatment, while in China and Viet Nam the median was about 3 weeks later. By comparison, the median time to death was slightly over 1 month in Orel, Russia,[26] and almost 5 months in Estonia.[22] Patients with a history of prior treatment, a high grade of sputum smear positivity, and extra-pulmonary disease had an increased risk of death.

The strength of this study is that we used a representative sample of TB case registers from three countries with a rigorous system for quality-assured data entry and validation and standardized methodology. It reflects what is offered and can be achieved through routine services, but has the inherent weakness that information is missing that would help further elucidate factors influencing treatment outcome, such as information on HIV co-infection and drug resistance. While we ensured that our electronic data set was an accurate reflection of the case registers, the veracity of the information that was entered into the registers cannot be assured in this type of study.

CONCLUSION

We demonstrate that high success and low proportions of death and default were achieved using routine treatment delivery services in the three countries. While no single risk factor for default could be isolated in our study, it nevertheless showed that the majority of defaulting occurs at the beginning of treatment. This will require a critical review of treatment support in this period. Patient characteristics (higher age and male sex) and disease characteristics (extra-pulmonary, high diagnostic bacterial load, history of prior treatment), factors not amenable to direct program intervention, were all associated with increased risk of death. This highlights the need for improvements in the general health infrastructure to facilitate early access to diagnosis and close supervision of treatment progress among such patients.

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Objectif : Déterminer la fréquence et les caractéristiques des patients dont le traitement de la tuberculose (TB) n'est pas couronné de succès.
Méthodes : Sélection au hasard de registres de cas de TB dans toutes les unités de traitement du Cambodge, dans deux provinces de Chine et au Viet Nam. On a analysé les données de deux années-calendrier pour évaluer les résultats non couronnés de succès et le moment de leur survenue.
Résultats : Sur 33 309 patients TB, le traitement n'a pas été couronné de succès dans 10,1% au Cambodge, 3,0% en Chine et 9,1% au Viet Nam. Le risque de décès est le plus élevé au Cambodge, plus élevé chez les hommes que chez les femmes, va en croissant avec l'âge, est plus courant en cas de retraitement que pour les nouveaux cas et plus courant chez les patients dont le degré de positivité du frottis de crachats est élevé plutôt que faible. La moitié des décès sont survenus au cours des 2 premiers mois au Cambodge et dans les 11 premières semaines en Chine et au Viet Nam. La durée médiane avant l'abandon a été de 3 mois au Cambodge et au Viet Nam et d'environ 2 mois en Chine.
Conclusions : Dans les trois pays qui ont fait l'objet de l'étude, le traitement est très fréquemment couronné de succès, avec une faible proportion de décès et d'abandons. Comme la majorité des abandons survient au début du traitement, tous les pays devraient réviser de façon critique leur politique actuelle de soutien au traitement au cours de cette période.

Objetivo: Determinar la frecuencia del fracaso del tratamiento antituberculoso y las características de los pacientes.
Método: Se escogieron en forma aleatoria registros de casos de tuberculosis de todas las unidades de tratamiento en Camboya, dos provincias de la China y en Viet Nam. Se analizaron los datos de dos años civiles con el fin de evaluar los desenlaces desfavorables y el momento en que se presentaron.
Resultados: De los 33 309 pacientes con tuberculosis, un 10,1% presentó fracaso terapéutico en Camboya, un 3,0% en la China y un 9,1% en Viet Nam. El riesgo de muerte más alto se observó en Camboya, fue mayor en los hombres que en las mujeres, aumentó con la edad y fue más frecuente en los casos de retratamiento que en los casos nuevos y en los pacientes con una baciloscopia de esputo de alto grado que en los pacientes con un examen microscópico de bajo grado. La mitad de todas las defunciones ocurrió en los primeros 2 meses de tratamiento en Camboya y durante las primeras 11 semanas en la China y Viet Nam. La mediana del lapso hasta el abandono fue 3 meses en Camboya y Viet Nam y alrededor de 3 meses en la China.
Conclusiones: El tratamiento fue muy eficaz en los tres países estudiados, con una baja proporción de defunciones y abandonos. Dado que la mayoría de los abandonos ocurre al comienzo del tratamiento, todos los países deberían analizar de manera crítica su política vigente de apoyo al tratamiento durante este período.