

Delay in tuberculosis case-finding and treatment in Mwanza, Tanzania

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SUMMARY

SETTING: Health facilities in Mwanza region, Tanzania.
OBJECTIVE: To determine factors responsible for delay from onset of symptoms of pulmonary tuberculosis to initiation of treatment.

DESIGN: A cross-sectional descriptive study of 296 smear-positive tuberculosis patients. Emphasis was given to periods between 1) onset of symptoms and first consultation to a health facility, and 2) reporting to a health facility and initiation of treatment.

RESULTS: Mean total delay was 185 days (median 136), with nearly 90% of this being patient's delay. The mean health system delay was 23 days (median 15), with longer delays in rural health facilities. The mean patient's delay was 162 days (median 120). This delay

was significantly longer in rural areas, for patients with lower level of education, for those who first visited a traditional healer, and for patients who had no information on tuberculosis prior to diagnosis. Only 15% of the patients reported to a health facility within 30 days of onset of symptoms.

CONCLUSION: There are significant delays in case-finding in Mwanza, Tanzania, with prolonged patient's delay. Facilitation of utilisation of health services, raising awareness of the disease and incorporation of private practice into tuberculosis control could help to reduce these delays.

KEY WORDS: delay; tuberculosis; case-finding; Tanzania

IN 1993, the World Health Organisation (WHO) declared a state of global emergency for tuberculosis, due to the steady increase of the disease worldwide.¹ In Tanzania tuberculosis cases rose by about 200% from 1985 to 1995. This was partly due to an increase in population and therefore more transmission of the disease. However, an increased prevalence of human immunodeficiency virus (HIV) has also played an important role.²

Case-finding in Tanzania is passive, and tuberculosis control is integrated into the general health system, depending on the patients themselves to present to the health facility when they suspect that they have symptoms of tuberculosis. It has been shown that one untreated smear-positive tuberculosis patient can infect up to 15 other people in the course of one year.³ Thus, early case detection followed by effective therapy is crucial to the prevention and control of the disease.

Delays in case-finding are common, and have been studied to some extent in other countries.⁴⁻⁷ However, little is known about the magnitude of this problem in Tanzania. The purpose of this study, therefore, was to investigate factors responsible for delay, both from the onset of symptoms to diagnosis, and from diagnosis to commencement of therapy.

METHODS

Patients and procedures

Consecutive smear-positive pulmonary tuberculosis patients in Mwanza region, Tanzania, were included in a comparative cross-sectional study during a 2-month period, from May to July 1998. Mwanza is located in the north-western part of Tanzania on the shore of Lake Victoria, with a population of about 2.5 million. The region has 11 hospitals (including one consultant/referral hospital), 27 health centres and 251 dispensaries.

In 1997, this region had 2934 cases of tuberculosis, with 1641 new smear-positive tuberculosis patients. Case notification rate was 111 cases per 100 000 population, with an average of about 137 new smear-positive cases each month (Mwanza region, 1997 TB report). Case-finding activities are carried out at all health facilities. Diagnosis is mainly based on sputum examination of all cases presenting with cough lasting more than 3 weeks. Sputum microscopy is performed in hospitals, health centres and some dispensaries. If any two of the examined sputum specimens are positive for acid-fast bacilli (AFB), the patient is taken to be a case of tuberculosis and should receive treatment.²

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The tuberculosis programme in Tanzania presupposes initial diagnosis and treatment of tuberculosis in dispensaries and health centres on an ambulatory basis, provided the patients are strong enough to follow their treatment and are free from complications that need hospital care. The services are free of charge.^{2,8}

Two different populations were studied, an urban population in Mwanza municipality, and a rural population from three neighbouring districts (Magu, Sengerema and Misungwi).

The study sample consisted of 300 patients. The majority were out-patients, with only 33 (11%) in-patients. Cases were included in the study if they were new smear-positive tuberculosis patients. Relapses and retreatment cases, as well as children and people below the age of 15 years, were excluded from the study. Four patients were excluded from analysis because of insufficient information.

The following variables were recorded: 1) the time period between onset of symptoms and first contact with a health facility; 2) the time period between reporting to a health facility and diagnosis; and 3) the time period between diagnosis and start of treatment. To obtain this information, each patient was interviewed by one of the authors or a trained assistant, using a structured questionnaire. Patient files and tuberculosis treatment cards were also checked. In addition, factors responsible for delay and the health facility first visited by the patients were recorded.

Period between onset of symptoms and reporting to the health facility

The day when the patient first became aware of symptoms was defined as the onset of symptoms that ultimately resulted in his or her being seen at a health facility. Thus, if the patient reported having felt chest pain for over a year, but was seeking medical advice for haemoptysis which he or she had only noticed in the previous 7 days, the period from the day when the patient first became symptomatic was recorded as 7 days.

As no scientifically agreed criteria could be found in the literature upon which to base a definition of delay, six general practitioners and one specialist physician treating tuberculosis patients on a routine basis at Bugando referral hospital were asked to choose 'acceptable' delay, based on their medical knowledge and taking into account the socio-economic conditions of their patients. From this, a period of 30 days was chosen as maximum 'acceptable' delay.

Period between reporting to a health facility and initiation of treatment

The time span between reporting to a health facility through diagnosis to the day when the patient commenced treatment was defined as the health system delay. From the answers of the seven doctors men-

tioned above, a period of 10 days was chosen as maximum 'acceptable' delay.

Data analysis

Data were analysed using SPSS 6.11. χ^2 with Fisher's exact test was used when appropriate for analysing categorical data. Continuous variables were analysed using *t*-test for independent variables. The level of statistical significance was set at 5%.

RESULTS

Demographic characteristics

The basic patient characteristics are shown in Table 1. The male to female ratio was 2:1 in both the rural and urban population. Overall mean age was 36.2 years (range 17–71, SD 12); the mean age among males was 37.8 years, which was significantly older than among females (33.1 years, $P < 0.029$). More than half of the patients (65.9%) were aged under 44 years. Rural areas had slightly more cases aged 45 and over.

Significantly more rural people lived >10 km from the health facility among the sample selected (OR 17.67 [9.23 < OR < 34.16], Mantel Haenszel $\chi^2 = 104.62$, $P < 0.0001$).

One quarter (24.8%) of the patients had no formal education, 65% had primary education (compulsory), while only 10% had a higher level of education. Urban patients were more highly educated (11.8%) than rural ones (6.1%) (Table 1).

Period between onset of symptoms and reporting to a health facility

The mean period between onset of symptoms and reporting to a health facility for all patients was 161.7 days (median 120, SD 125.7) (Table 2). A longer mean period was noted in patients aged 45 years and over, patients in rural settings, distance more than 10 km from a health facility, patients who had no infor-

Table 1 General characteristics of the patients studied

	Urban n (%*)	Rural n (%*)	Total n (%*)
Population studied	197 (66.6)	99 (33.4)	296 (100)
Sex			
Male	128 (65.0)	69 (69.7)	197 (66.6)
Female	69 (35.0)	30 (30.3)	99 (33.4)
Age (years)			
<45	136 (69.0)	59 (59.6)	195 (65.9)
≥45	61 (31.0)	40 (40.4)	101 (34.1)
Distance from health facility			
≤10 km	161 (81.7) [†]	20 (20.2) [†]	181 (61.1)
>10 km	36 (18.3) [†]	79 (79.8) [†]	115 (38.9)
Education			
No education	32 (16.4)	41 (41.4)	73 (24.8)
Primary education	140 (71.8)	52 (52.5)	192 (65.3)
Higher education	23 (11.8)	6 (6.1)	29 (9.9)

* Percentages are out of respective column total.

[†] $P < 0.0001$.

Table 2 Period between onset of symptoms and reporting to the health facility

	Mean days \pm SD	Patients reported within 30 days (%)
All	161.7 \pm 125.7	15.2
Males	161.2 \pm 126.5	15.7
Females	162.9 \pm 124.8	14.1
Age		
<45 years	142.6 \pm 104.6*	15.9
\geq 45 years	198.6 \pm 152.8*	13.9
Urban	120.2 \pm 80.2*	16.2
Rural	244.3 \pm 156.1*	13.1
\leq 10 km	115.8 \pm 85.4*	21*
>10 km	233.9 \pm 144.2*	6.1*
Informed about TB	145.2 \pm 114.3*	19*
Not informed	220.3 \pm 146.4*	1.5*
Primary education and below	171.9 \pm 125.6*	9.4*
Above primary education	58.9 \pm 64.9*	69*
First visit to health facility	94.9 \pm 64.6*	24.3*
First visit to traditional healer	266.9 \pm 126.7*	0.9*

* $P < 0.05$.

mation on tuberculosis prior to diagnosis, and those with education background below primary school. These differences were significant. However, the difference between males and females concerning this period was not significant ($P = 0.854$).

Adopting the definition proposed by the group of doctors interviewed, only 45 patients (15.2%) reported to the health facility within the 'acceptable' period of 30 days, with 84.8% waiting longer than the 'acceptable' period. The shortest period was 14 days (two patients, 0.7%). 27.7% of the sample had not reported 6 months after the onset of symptoms, 8.8% had not reported after one year, and four patients (1.4%) took as long as one and a half years after the onset of symptoms to report.

With the exception of the patients who lived closer than 10 km away from a health facility, those who had information on tuberculosis prior to diagnosis and those who had education at a higher level than primary school, no significant difference was found between urban and rural area ($P = 0.154$), male and female ($P = 0.469$), or older and younger patients ($P = 0.352$), when analysed separately with respect to the 'acceptable' delay period.

Period between reporting to the health facility and initiation of treatment

The overall mean time interval from the patient's first visit to a medical facility until commencement of treatment was 22.8 days (median 15, SD 21.4). One-third of patients (33.8%) initiated treatment within 10 days of the first visit, with 66.2% of patients starting treatment beyond this 'acceptable' period. Eight patients (2.7%) received their treatment only 3 days after reporting to a health facility, while three patients

had not yet initiated treatment by 3 months. Rural health facilities had a significantly longer delay (mean 41.5 days) than urban health facilities (13.5 days, $P < 0.0001$).

The mean period from first reporting to a health facility to diagnosis was 21 days (median 14, SD 20.4). The majority of patients (77.4%) received their treatment on the day the diagnosis was established. Treatment for 25 patients (8.4%) started on the following day, and a further 10 patients (3.4%) 2 days after. The remaining 32 patients (10.8%) were not treated within 3 days, with the longest delay of 14 days (three patients)

The place of first visit and final diagnosis

One third of the patients (38.9%) first visited a traditional healer after the onset of symptoms, compared to 61.1% who visited a health facility as their first point of call. The mean delay for those who visited a traditional healer was longer (266.9 days) compared to those who first consulted a health facility (94.9 days) (Table 2). The majority of those who first presented to a traditional healer lived in a rural area (63.5%).

For those who first visited a health facility, dispensaries were the first point of call for most patients (59.7%). Almost all patients (95%) presented with more than one symptom. Cough was the main presenting symptom (89.5%), followed by fever (69.6%), and chest pain/tightness (30.4%).

The place where the final diagnosis was made could be determined for 289 patients. Diagnosis for 75 patients (26%) was established in the health facility they first visited with shorter mean delay in diagnosis (9.6 days) compared to the remaining 214 patients (74%) whose diagnosis was made elsewhere (24 days). The difference was highly significant ($P < 0.0001$). The majority of the patients had their diagnosis established in hospitals (58.5%) in both rural and urban areas.

Total delay

Total delay was defined in this context as the interval from onset of symptoms through diagnosis to commencement of treatment. As shown in Table 3, only 3.7% of the patients were treated within one month after the onset of symptoms, 26.4% within 3 months, and for a further 12% more than 12 months elapsed before they started treatment.

DISCUSSION

Our study shows that there is a substantial delay from onset of symptoms to reporting to a health facility for pulmonary tuberculosis patients. Comparing the means of the patient's delay and total delay, one can see that close to 90% of the total delay is ascribed to the patient, which identifies a possible area for intensifying intervention strategies.

Table 3 Total delay by background (cumulative distribution)

	Percent treated after onset of symptoms within					
	1 month	3 months	6 months	9 months	12 months	>12 months
Total (n = 296)	3.7	26.4	59.5	78.7	87.8	100
Area						
Urban	5.1	32.5	74.6	92.9	97.5	100
Rural	1.0	14.1	29.3	50.5	68.7	100
Sex						
Male	4.1	28.5	57.9	77.7	88.9	100
Female	3.0	22.2	62.6	80.8	85.9	100
Age						
<45 years	4.1	28.7	64.6	84.6	93.3	100
≥45 years	3.0	21.8	49.5	67.3	77.2	100
Distance						
≤10 km	5.0	37	75.7	91.7	97.8	100
>10 km	1.7	9.5	33.8	58.1	72.0	100
Education						
≤ primary	1.5	21.9	56.2	77.3	86.7	100
> primary	24.1	68.9	93.0	96.4	100	—
First visit						
Health facility	6.1	42.0	86.2	96.7	100	—
Traditional healer	—	1.7	17.4	50.4	68.7	100

While it is possible to have longer periods of delay between onset of symptoms and reporting, due to vagueness of the symptoms which are also quite common in other illness such as malaria, it is of considerable public health concern that 10% of the patients delayed commencing treatment up to 3 days after diagnosis and several others up to 14 days.

The patient's delay was significantly associated with the distance from home to the clinic, education level and the patient's knowledge about tuberculosis. This was true whether the more conservative criterion of 30 days was adopted or not. Rural patients had significantly longer delay than their urban counterparts. Sex showed no significant association. A multivariate procedure was also applied in order to sort out factors relevant to patient's delay for possible confusion due to internal correlation among observed variables. Sex and age showed no significant association. This may suggest that the most important determining factors for patient action are availability and accessibility of medical services (as is the case in present-day Tanzania), and knowledge about the disease. It may further indicate that people's health related action is less likely to be improved merely by superficial motivation working only on demographic features.

The majority of the patients in this study (58.5%) had their diagnosis established at hospital level. Following the liberalisation of medical practice in Tanzania in the early 1990s and the introduction of user fees in public hospitals, there has been an increased use of the private sector. In one study in Dar Es Salaam, 41% of people used private sector services compared to 35% who used public services.⁹ Although patients were not specifically asked whether they first

attended a public or private health facility in this study, it is possible to conclude that private practice is playing an increasingly important role as first contact for tuberculosis patient with the health system. Thus there is a need for the National Tuberculosis Programme to render the private sector complementary to public services in the control of tuberculosis.

Worthy of note also is the fact that, in the present study, nearly one third of the patients visited a traditional healer as the first point of call. Studies in other countries have found that traditional healers play an important role as first contact for TB patients.^{10,11} In Malawi, health education for traditional healers and the need to educate them on recognising and referring TB patients was recommended,¹⁰ and in South Africa traditional healers were involved in providing community DOT to TB patients.¹¹ The role of the private sector, including traditional healers, in tuberculosis control in Tanzania is an area that warrants further study. However, it should be kept in mind that observations in this study are limited to those who had been recognised by the health services. A prospective community-based study would give a good comparison group and minimise the health worker effect, which is otherwise difficult to identify in this study.

The median doctor's delay in this study was 15 days. This is similar to reports from Korea.¹² Other studies have shown that health system delays are longer than patient delays.^{6,7,13} Health system delay in our study was surprisingly short compared with the 1 month delay recently reported in Japan.¹³ The higher tuberculosis prevalence in Tanzania may, however, make Tanzanian medical personnel more alert to tuberculosis than would be expected in a low-prevalence country such as Japan. On the other hand, the longer

patient delay in Tanzania may make tuberculosis easier to diagnose, as patients present at a more advanced stage of the disease.

The fact that patients who had no information on tuberculosis prior to diagnosis had significantly longer delay in reporting than their counterparts highlights the importance of intensifying public health education.

As was shown by reviewers of the Tanzania tuberculosis control programme,¹⁴ tuberculosis has rarely been a topic addressed among most mothers attending Maternal and Child Health services, and few posters discuss the disease in health facilities in Tanzania. Health education campaigns about tuberculosis have proved to be quite successful in the past in industrialised countries,¹⁵ and there is no reason to believe they wouldn't be successful in developing countries. The results of this study are consistent with the view that the main area for intervention in reducing patient's delay lies in facilitation of utilisation of the health services and raising awareness of the disease.

It must be emphasised that both patient's as well as doctor's delay present a substantial challenge to tuberculosis programmes, and should be addressed as a matter of priority.

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RÉSUMÉ

CADRE : Services de santé de la région de Mwanza en Tanzanie.

OBJECTIF : Déterminer les facteurs responsables du délai séparant le début des symptômes de tuberculose pulmonaire et la mise en route du traitement.

SCHEMA : Etude descriptive transversale. Examen de 296 patients tuberculeux à bacilloscopie positive. Examen attentif des périodes séparant 1) le début des symptômes et le premier recours à un service de santé, et 2) le recours à un service de santé et la mise en route du traitement.

RÉSULTATS : Le délai total moyen fut de 185 jours (médiane 136), dont près de 90% provenant du délai-patient. Le délai moyen du système de santé était de 23 jours (médiane 15), avec des délais plus longs dans les services de santé ruraux. Le délai-patient moyen était de

162 jours (médiane 120). Le délai était significativement plus long dans les zones rurales, chez les patients à niveau d'éducation plus bas et chez ceux qui avaient consulté initialement un guérisseur traditionnel, ainsi que chez ceux qui n'avaient avant leur diagnostic aucune information concernant la tuberculose. Seulement 15% des patients se sont présentés dans un service de santé dans les 30 jours faisant suite au début des symptômes. **CONCLUSION :** Il y a des délais significatifs de dépistage à Mwanza en Tanzanie avec un délai-patient prolongé. Pour aider à réduire ces délais, il faudrait faciliter le recours aux services de santé par la population, accroître la conscience de la maladie chez les patients et incorporer les praticiens privés dans la lutte contre la tuberculose.

MARCO DE REFERENCIA: Establecimientos sanitarios en la región de Mwanza, Tanzania.

OBJETIVO: Determinar los factores responsables de la demora desde el comienzo de los síntomas de la tuberculosis pulmonar hasta la iniciación del tratamiento.

MÉTODO: Un estudio descriptivo cruzado. Se examinaron 296 pacientes con tuberculosis con baciloscopia positiva. Se dió énfasis a los períodos entre 1) el comienzo de los síntomas y la primera consulta a un centro médico, y 2) entre el envío a un centro médico y la iniciación del tratamiento.

RESULTADOS: La demora promedio total fue de 185 días (mediana 136), de la que casi el 90% fue demora del paciente. La demora promedio del centro médico fue de 23 días (mediana 15) con demoras más prolongadas en

los centros rurales. La demora promedio del paciente fue de 162 días (mediana 120). La demora fue mucho más larga en las áreas rurales para los pacientes con educación más baja, para aquellos que visitaron primero a un curandero y para los pacientes que carecían de información sobre la tuberculosis antes del diagnóstico. Sólo el 15% de los pacientes fueron enviados a un centro médico dentro de los 30 días del comienzo de los síntomas.

CONCLUSIÓN: Hay demoras importantes para la detección de casos en Mwanza, Tanzania, con demoras prolongadas de los pacientes. Se pueden reducir estas demoras si se facilita a la población el uso de los centros médicos, si se aumenta el conocimiento de la enfermedad por parte de la población y si se incorpora a los médicos privados al control de la tuberculosis.
