

# Factors associated with patient and health service delays in the management of TB in Central Equatoria State in 2008

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## Abstract

**Background:** Tuberculosis (TB) is caused by the bacterium *Mycobacterium tuberculosis*. Delays in diagnosis and treatment increase morbidity and mortality from tuberculosis, and the risk of transmission in the community.

**Methods:** We conducted a cross-sectional survey at three TB treatment centres in Central Equatoria State, South Sudan. Smear-positive TB patients were enrolled in three study sites and interviewed within two days of beginning treatment using a structured questionnaire. This study was conducted to investigate factors that affect patient and health service delays in diagnosis and treatment of pulmonary tuberculosis (PTB) in Central Equatoria State.

**Results:** 129 patients were enrolled in the study. The median patient's, health provider's and total pre-treatment periods are 4, 10 and 16 weeks respectively. The health care provider delay for patient diagnosis and start of treatment had the greatest contribution to overall total pre-treatment delay

**Conclusions and recommendations:** In Central Equatoria State, health care provider delay was the most frequent type of delay observed and was a major contributor to the overall total delay.

This study indicated the need for strengthening the capacity of health workers for early detection and referral of TB patients. Further research is needed to identify reasons for health provider delay.

**Key words:** *Mycobacterium tuberculosis*, health service delays, South Sudan

## Background

Tuberculosis (TB) is caused by the bacterium *Mycobacterium tuberculosis* and occasionally by other species of *Mycobacterium tuberculosis* complex that includes *Mycobacterium bovis*, *Mycobacterium africanum* and *Mycobacterium canettii*. These organisms are also known as tubercle bacilli or Acid-Fast Bacilli (1, 2). TB is spread by one person inhaling the bacterium in droplets in the coughs or sneezes from someone with infectious tuberculosis (3).

In Central Equatoria State there are three different levels of TB services:

- The State Ministry of Health is responsible for the National Tuberculosis Programme (NTP) in Juba town (urban)
- The International Medical Corps (IMC) is responsible for the TB services in Kajo Keji County (rural) and

- Malteser International is responsible for TB services in Yei River County (rural).

The management practice in Yei and Kajo Keji (rural) which are run by Non Governmental Organizations (NGOs) admit patients diagnosed with TB to their TB treatment centres for two months on Direct Observe Treatment Short course strategy (DOTS) until clinical improvement is noted, and then discharge them for home-based continuation treatment for 4-6 months. In Juba, the State Ministry of Health provides patients with weekly outpatient treatment until the course is completed in 6-8 months.

Delays in tuberculosis diagnosis and start of treatment increase morbidity and mortality from tuberculosis, and the risk of its transmission in the community (4, 5, 6, 7).

## Operational definitions

**Patient's Period:** The period from onset of symptoms to the first contact with health provider.

**Health Provider-Period:** The time interval from patient's first contact with a health provider to the start of treatment.

**Pre-Treatment Period:** The period from onset of symptoms to start of anti-TB treatment. Total pre-treatment period was in turn divided into three periods, patient period, health system period; this in turn is divided into, health provider delay and diagnosing facility delay.

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## MAIN ARTICLES

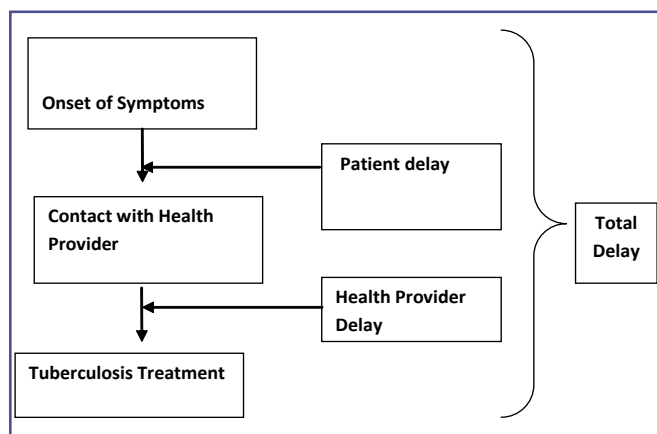


Figure 1. Diagram showing levels of delay

This study was conducted to investigate factors that affect patient and health service delays in the diagnosis and treatment of pulmonary tuberculosis (PTB) in Central Equatoria State (Figure 1).

### Methods

We conducted a cross-sectional survey at three TB treatment centres in Central Equatoria State. Smear positive TB patients were enrolled in the three study sites and interviewed within two days of beginning treatment using a structured questionnaire between September and December, 2007.

Sample size was calculated using Epi Info version 6, Statcalc, November, 1998 program for cross-sectional studies, using the following assumptions:

- Proportion of pre-treatment delay in unexposed (15%) and proportion of pre-treatment delay in exposed (40%).
- Ratio of exposed to unexposed was 1:1.8,
- Odds ratio (OR) was 3.75,
- Alpha ( $\alpha$ -1) or Confidence Interval (CI) was 0.05
- The Power of the study ( $1-\beta$ ) was 80%.

Patient's delay was defined as more than 4 weeks from TB symptoms to first contact with a health care and provider delay was more than 2 weeks from first encounter with health provider and initiation of the therapy.

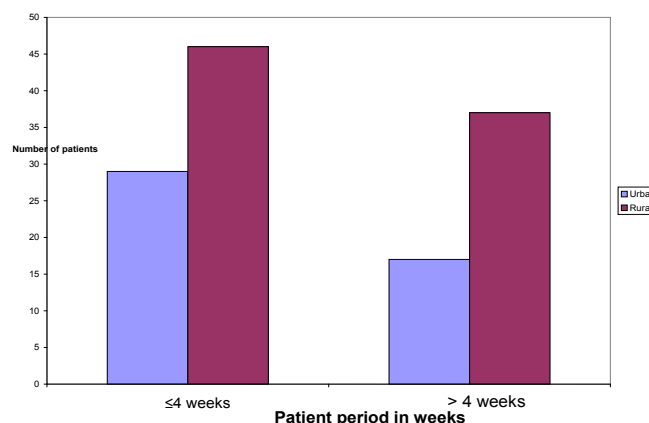


Figure 2. Period between onset of symptoms and first contact with health provider

### Results

Of 129 participants enrolled in the study, the median patient's, health provider's and total pre-treatment periods were 4, 10 and 16 weeks respectively.

The most common initial points of care were a public health facility (50%), followed by a drug shop or pharmacy (23%), a private provider (17%), and a traditional healer (10%). The health care provider delay for patient diagnosis and start of treatment had a greater contribution to overall total pre-treatment delay (as shown in Table 1).

Analyses of data for the cause of delay indicate that 45% (58/129) was due to poor access to a TB treatment centre. Lack of knowledge of symptoms of TB was reported by 35% (45/129), 12% (15/129) of the patients were too busy with work to seek help, and 9% (11/129) gave no reasons as the cause of their delay (Figure 3).

Out of the 129 participants who visited TB centres, in the urban centre (Juba) 29.5% (38/129) waited less than week for their treatment to start compared to 64.3% (83/129) in rural centres (Yei & Kajo Keji). However all the 8 participants who had to wait more than one week to start treatment were attending the urban TB treatment centre in Juba. There was a statistical significant difference in this delay between urban and rural TB centres ( $\chi^2=15.4$ ,  $P \leq 0.001$ ), meaning that those attending a rural TB centre were less likely to have delayed treatment than those attending the urban TB centre.

Table 1. Total pre-treatment delay associated with health provider delay

Variable	>6 weeks	≤ 6 weeks	$\chi^2$	OR	95% CI	P-value
Patient delay	67	08	3.76	6.33	0.8-139.1	0.079
Provider delay	115	02	53.8	80.5	10.8-784.4	0.000

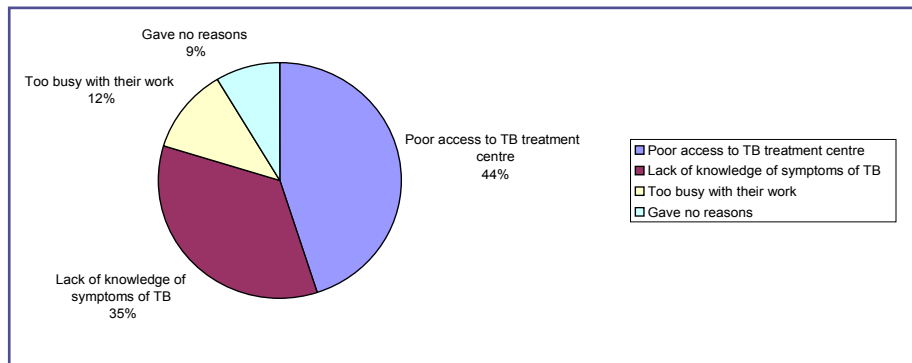


Figure 3. Reasons for patient delay in contacting a health provider

### Conclusions:

In Central Equatoria State, health care provider delay was the most frequent type of delay observed and was a major contributor to the overall total delay. The study clearly demonstrates the weakness of the urban (Juba) TB centre to diagnose and manage TB patients.

### Recommendations:

1. This study indicated the need for strengthening the capacity of health workers for early detection and referral of TB patients.
2. There should be targeted health education of the general public on tuberculosis, and continuing education about TB management procedures for health providers.
3. The National Tuberculosis Control Programme should improve supervision of the health facilities, for better TB control
4. Further research is needed to identify reasons for health provider delay.

The study has the following limitations:

1. Hospitals studies are not representative of the community.
2. The sensitivity of direct microscopy is reduced in early-stage pulmonary patients, HIV co-infected patients (potential for selection bias) and
3. Recall bias. The measurements of different pre-treatment periods were depending mainly on patients' recalls, which might be imprecise and liable to recall bias. In fact, very specific measurements of the pre-treatment periods are almost impossible due to the absence of lack of

case notes and referral letters to verify the accuracy of information given

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