

## A Clinical Audit on the care of Adult Tuberculosis Contacts In a Public Primary Care Clinic, Malaysia

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### ABSTRACT

**Introduction:** The National Clinical Practice Guideline in Tuberculosis (TB) was designed to improve the quality of tuberculosis care. However, it remains unknown whether primary care doctors adhere to it well. This audit aims to assess the quality of care in the process of TB contact tracing in a primary care setting. **Methods:** Data on TB contact tracing from 1<sup>st</sup> February 2013 to 15<sup>th</sup> February 2013 was obtained retrospectively from all medical records of diagnosed pulmonary TB in a public primary care clinic. All patients who fulfilled the inclusion and exclusion criteria were included in the study. **Results:** A total of 102 medical records of adult TB contacts were recruited. The median age of the TB contact was 34 (IQR=10) years and 65 % were male. Seventy two percent of the adult TB contact had a TBIS 10C3 form created, and 95% of the medical records were fully documented. History taking and physical examination were recorded on 97% and 99% of patients respectively during the first follow-up at the polyclinic. Eighty five percent and 100% of the patients had a chest-x-ray and sputum direct smear for acid-fast bacilli done respectively. The turn-up rate for the first, second, third and fourth visit was 100% to 32%, 10% and 2% respectively. **Conclusion:** The quality of care for adult TB contacts tracing in this clinical audit was found to be suboptimal. There is a difference between the current national guidelines and practice in the clinic. Certain measures to improve the quality of care for adult TB contact tracing are urgently needed.

**Keywords:** Tuberculosis, Contacts, Tracing, Primary care, Audit, Malaysia

### INTRODUCTION

Effective contact investigations are paramount to the success of tuberculosis (TB) control. This is in view of TB still remains a global public health threat despite various strategies implemented by WHO in reducing its spread.<sup>1</sup> In 2011, there were 8.7 million estimated new cases of TB with 1.4 million people died from it globally.<sup>2</sup> Similarly, in Malaysia, a country which had been listed as one of the countries with high-incidence of TB case,<sup>2</sup> 4,251 new cases were documented within the last 6 years. The number of new TB cases was reported to be increased from 15,000 cases in 2005 to 19,251 cases in 2011<sup>3</sup> Sepang, one of the districts in Selangor Malaysia also faces the same problem where the reported new TB cases had increased from 35 cases in 2009 to 48 cases in 2010 and 61 cases in 2011.<sup>4</sup>

A tuberculosis case can have many contacts and remains infectious till the patient had completed anti-tuberculosis treatment for two weeks. Study reported that the persons surrounding the TB patients has a higher risk of getting infected particularly for the first year of contact (OR=4.5, 95% CI 4.3 to 4.8).<sup>5,6</sup> Thus, contact tracing of these persons who have been exposed to TB is of utmost crucial for early case detection and timely treatment.<sup>7,8</sup> According to the Malaysian's Clinical Practice Guideline (CPG) on TB management,<sup>9</sup> TB contacts is referred to all persons in the same household or close contact with the presenting index case.<sup>9</sup>

Clinical audit is a tool that permits evaluation of the quality of care on a current practice of a specific medical condition.<sup>10</sup> The quality of care is gauged against a standard set of criteria recommended by clinical guidelines. Clinical audit is a process of improving the patient care and outcomes through a systematic review of implementation against specific criteria and review of change. National TB control programmes should evaluate the effectiveness of its contact tracing routinely and improve the performances accordingly. However limited audit has been carried out to look at the quality of care for TB contacts tracing. Thus, the aim of this audit was to determine the adherence to the requirement as stated in the Clinical Practice Guideline during process of TB contact tracing in a public primary care clinic, Malaysia.

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## METHODOLOGY

### Setting

This audit was conducted in a suburban public primary care clinic in Sepang, Malaysia between 1<sup>st</sup> of February 2013 to 15<sup>th</sup> February 2013. This local primary care clinic serves a minimum population of 28,126 person<sup>11</sup> with the service provided by a family medicine specialist, 10 medical officers, 2 medical assistants, 7 nurses and 18 community nurses. The clinic is fully equipped with basic in-house laboratory facilities for investigation of TB index patients with pulmonary disease, a pharmacy for anti-TB dispensing and TB clinic for TB contact tracing and control.

### Process of care

All medical records of TB contacts aged 13 years old or older and under follow-up from January 2012 to December 2012 were identified and selected into this audit. TB contacts with pre-existing tuberculosis were excluded.

The contact tracing procedure in this public primary care clinic is based on the national CPG and clinic's protocol. TB contacts will be identified by the District Health Inspector and the name list will be sent to the staff in-charge of the TB contact tracing in the clinic. Once the TB contact presents at the clinic, he/she will be registered and a medical record consist of TBIS 10C3 form will be created. At the same time, the treating doctor will gather information regarding the health background of the contact and make a face-to-face assessment. During follow up, assessment and needs for further tests are based on clinical judgement. Chest x-ray (CXR) is the first line investigations for the contacts followed by sputum for acid fast bacilli.

The processes in TB contact tracing care were captured by the use of indicators. The indicators of the audit consist of TBIS 10 C3 form, completeness of the medical record on the TB index's particular, contacts' particular, history taking, physical examination and weight measurement. It was agreed that the chest x-ray should be done and reviewed during the first visit, three samples of sputum AFB should be ordered for this symptomatic contact with normal chest x-ray or contact with abnormal chest x-ray. Each TB contact is expected to complete four times follow-ups in a year during which, the findings and diagnosis will be recorded.

Once we have chosen the indicators, the next step is to form the criteria where it will help us to define whether the process of TB contact tracing was practised or not.

Following that we will set the target level of performance that we would like to achieve in this audit. The level of the target performance is subjected to the reports from the pre-existing literature or pre-existing readings that had been achieved in the particular setting.

The indicators of quality care and the target level of performance in this audit were determined after a discussion with the clinic's doctor. Standard structured proforma and check list were used to ensure the completeness in obtaining data of socio-demographic and the TB contact tracing process.

### Ethic approval

The audit was registered under the National Medical Research Registry with a registration number of NMRR-13-61-15121. A verbal consent was obtained from the clinic's doctor and relevant authorities.

### Definition

Indicators are defined as the one which will be a valid measure of the process of TB contact tracing.

Target of performance is defined as the target expected to be achieved.

TBIS 10 C3 form: a medical record used to capture the care of TB contacts.

TBIS-10 D form: a medical record used to capture the defaulter in Tb management.

### Statistically analysis

SPSS version 21 was used to analyse the data. Continuous data was described as mean and standard deviation if the distribution was normal. When the data was a skewed distribution, median and interquartile range (25-75<sup>th</sup> percentiles) was used. Categorical data was reported as proportions (percentage).

## RESULTS

There were 141 TB contacts in the original data. However 39 TB contacts did not have the medical record/TBIS 10 C3 created. Hence, only 102 (72%) TB contacts with medical records were recruited in the audit. The demographic and clinical characteristics are presented in Table 1. The median age of the patients was 34 (IQR=10), ranging between 13 to 86 years old. The majority of the contacts were males (65%) and Malays (53.9%).

**Table 1:** Demographic of TB contacts (N= 102)

Characteristic	Number(N), Percentage of the patients (%)
<b>Gender</b>	
Female	36 (35)
Male	66 (65)
<b>Age group(years)</b>	
<20	8 (7.8)
20-29	15(14.7)
30-39	53(52.0)
40-49	12(11.8)
50-59	8(7.8)
60-69	4(3.9)
≥70	2(2.0)
<b>Ethnicity</b>	
Malays	55(53.9)
Indians	9(8.8)
Chinese	6(5.9)
Foreigners	32(31.4)

The process measure of care for TB contacts are summarised in Table 2. The TB contacts' personal information was completed in all cases. However only 95% of TB index' data were fully recorded in the TBIS 10 C3.

Among those who had their medical record TBIS 10 C3 created, only 97% and 99% had their history and physical examination recorded respectively. During the first visit, majority (83%) of the TB contacts had their CXR done in the clinic and 99% of the CXR were reviewed and recorded.

Sputum for AFB was appropriately ordered for all (100%) symptomatic contact with normal CXR and contact with abnormal CXR. Nevertheless, among those who went for the sputum AFB test, three samples of sputum AFB were taken in only 57% of them. In overall, only 79% of the TB contacts had their weight recorded.

**Table 2:** Process measure care of TB contact tracing (N=102)

No	Indicator	Criteria	Result	Target Level of Performance (%)
1	Complete medical record	Did the particulars of TB contact (name, I.C no., gender, ethnicity, race, address, contact no., occupation and relationship with index) was completed?	100%	100%
		Did the particulars of name and diagnosis of TB index been completed fully?	95%	100%
2	History recorded	Were TB symptoms recorded?	97%	100%
	Physical Examination recorded	Were respiratory system examination recorded?	99%	100%
3	Chest x-ray in the clinic for 1 <sup>st</sup> visit	Was CXR done or not?	83%	100%
	Chest x-ray reviewed for 1 <sup>st</sup> visit	Were the findings documented? (No lesion, minimal, moderately advance, far advance)	99%	100%
4	Sputum AFB	Was it ordered for symptomatic contact with normal Chest x-ray?	100%	100%
		Was it ordered for contact with abnormal Chest x-ray	100%	100%
		Were 3 samples taken?	57%	100%
5	Follow up	First: Was it done or not done for ALL contacts?	100%	100%
		Second: Was it done or not done for contacts that were first seen by a doctor 3 months ago?	32%	100%
		Third: Was it done or not done for contacts that were first seen by a doctor 6 months ago?	10%	100%
		Fourth: Was it done or not done for ALL contacts that were first seen by a doctor 12 months ago?	2%	100%
6	Body Weight	Was it recorded or not?	79%	100%

## DISCUSSION

The persistence of active tuberculosis infection is a major public health problem especially from those active tuberculosis in whom the disease remain undiagnosed or the diagnosis was delayed.<sup>12</sup> Thus, effective contact tracing is paramount in limiting the spread of tuberculosis (TB) infection as well as in identifying infected person at an early stage.

The adult TB contact tracing care process at this public clinic has a good potential for improvement in view of the suboptimal quality of care. The missing medical record/TBIS 10 C3 forms of 39 (27.7%) TB contacts, could be due to the fact that the patient was registered under the new electronic TelePrimary Care (TPC) system, instead of the usual manual registration. Besides that, the contacts' record was kept in room 16 and only one staff in-charge is responsible for the TB contact tracing. This dedicated staff is handling multiple tasks as well; hence the focus on the management of TB contact may not be full as there is difficulty in accessing the records when the staff is engaged or unavailable. To overcome these deficiencies, we would suggest that another dedicated staff should be trained to assist the appointed staff nurse in managing TB contacts.

CXR is a common general screening and diagnostic tool for respiratory illness [13]. In our audit, we found out most (83%) of the TB contacts had a chest x-ray done in this local clinic and 99% have their CXR reviewed and recorded. The target level of performance for CXR was 100%. However, only 83% was achieved which may leads to misdiagnosis since the CXR is a good tool to rule out tuberculosis<sup>14</sup> and the result is readily available on the spot in the clinic; Nevertheless, it is possible for the CXR machine to be non-functioning at times. On the other hand, this finding was slightly better than the other audit, whereby many adult TB contacts did not have any chest x-ray done.<sup>15</sup> Hence, the barriers should be identified and changes should be implemented to improve the rate of the CXR request. One suggestion is to create a comprehensive check list which will be placed on each medical record during registration.

The presence of acid fast bacilli in sputum test among those with abnormal CXR findings would certainly improve the early detection rate of tuberculosis.<sup>13</sup> However, only 57% of the TB contacts had their three sputum samples collected despite being advised to do so within two days duration. This could be explained by the absence of a specific reminder system and default by the TB contacts. In view of the above setbacks, an intensive patient education coupled with an affordable reminder system should be in place to prevent further default of TB contacts either from their investigations or follow up. Besides that further study is urgently needed to invent a rapid diagnostic test for tuberculosis in which the test is readily available, simple, reliable and cost-effective.<sup>16</sup>

According to the clinic's protocol, each contact should have four times follow-up in a year from the first visit. However, only 32%, 10% and 2% of TB contacts turned-up for second, third and fourth follow-up respectively. This could be explained by the fact that some of the patients may be at different stage of follow-up, so this explains why the follow up is so low.

The low follow-up at the subsequent visit might be underestimated as another essential form called TBIS-10 D was not included in this audit. This TBIS-10 D form is the form that is being sent to the District Health Inspector for further action, who will feed back to the clinic about the defaulter. Some of the TB contacts might either have been transferred to another centre for follow up, go back to their hometown or unable to be traced. Despite the TB contact in this clinic received a hand phone reminder twice before their appointment; the reminder system may not be working well if the house number instead of the hand phone was kept in the record. Thus, other options of the defaulter tracing system including the use of social network analysis, geographic information systems and genomics should be given a try. Studies reported that these methods show a potential for improving tuberculosis control.<sup>17 18</sup>

If the patients infected with tuberculosis, then the patient will lose weight. However, the finding in this audit shows that not all the TB contacts' weight was monitored during the follow-up and this could be due to manpower constraint. The medical person in-charge of directing observed therapy for TB index can probably help to monitor the weight of TB contact cases.

### Limitation and recommendation

Limitation is this audit is it is only a one-off study and future recommendation is needed to take certain steps to identify the barrier why the performance is not up to 100%. We recommend that the audit cycle should be completed after 6 months to look for improvement following the intervention.

In conclusion, this audit shows that there is a difference between guidelines and clinical practice in providing an optimal care in TB contact tracing in this clinic. The care in monitoring and keeping up with the process of the TB contact tracing and follow-up are crucial for this clinic. Hence, we recommend implementing an intervention on how to improve the defaulter rate in this clinic and future audit should include the TBIS-10 D form.

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