

# A Descriptive Study on Contact Tracing of Pulmonary Tuberculosis in Sri Lanka

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## Abstract

**Introduction:** Tuberculosis is worldwide public health problem. Though it was 50 years since the discovery of effective treatment for TB, it has not been controlled. It continued to spread resistance among poor as well as affluent even in Sri Lanka. Treatment seeking behavior, management procedures and active contact tracing of PTB patients have the influence in controlling the disease.

### Objectives

- To determine effectiveness of contact tracing activities of PTB patient at Gampaha District.
- To determine supportive behavior of PTB index patients to trace contact.

**Methodology:** This study was cross sectional descriptive study which was carried out by using interviewer administrated questionnaire to identify effectiveness of contact tracing, supportive behavior of PTB patient, and screening activity of contacts.

**Limitations:** Sum of the questionnaires is depended on PTB index patient's recall memory. Interviewers were health care professionals therefore it is more likely that they tend to report standard answers other than actual answers. There was no allocation of money for staff and physical resources to conduct the study.

**Results:** Socio demographic data of PTB index patients were found to have a mean age of 47.66 in males and 45.37 in females and range was given 11 years-70 years. 77 index people were married and 80% were educated below the ordinary level and 70% were employed and 63% PTB positive. According to this data majority of PTB index patients are economically productive age group sputum positive, low educated and employed. About 98% of PTB index patients were educated regarding contact tracing by health care workers. But health care workers have directly informed to the family members only. They have not informed index patients, coworkers and room-mates. Only 40% family contacts were investigated for PTB, but none of them were positive. Below 5 years TB prophylactic treatments were started for 41% only.

**Conclusion:** Most of the PTB patients were in poor social economic group and their religion and ethnicity were reflecting the district population. All of the PTB patients have concerned only about their family members, none of them have informed co-workers and roommates. Health care workers were not done any effort to trace active contact tracing at work places. PTB prophylactic for below 5 years contact percentage was not satisfactory.

**Recommendations:** There should be a motivation programme to trace family contacts and co-workers contacts for health care workers. There should be a policy to trace contacts periodically. There should be a collaboration programme with ministry of labor and ministry of health to trace work place contacts.

**Keywords:** Pulmonary tuberculosis; Sri Lanka; Contact tracing

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## Introduction

Tuberculosis is a granulomatous disease, caused by *Mycobacterium tuberculosis, novise* or *africanum*. The disease primarily affects lungs and causes pulmonary tuberculosis. It can also affect intestine, meninges, bones and joints, lymph glands, skin and other tissues of the body. Pulmonary tuberculosis, the most important form of tuberculosis which affects man will be considered here.

Diagnosis of Pulmonary Tuberculosis is mainly based on history, examination and laboratory investigations. Most important symptoms are cough for more than two weeks, evening pyrexia, loss of appetite, loss of weight and night sweating. There are several investigations to diagnose PTB, from which, the sputum direct smear microscopy is the most reliable, sensitive and cost-effective method. Other methods include sputum culture, CXR, Tuberculin skin test, and PCR.

When it comes to treatment of TB, the modern strategy is based on standardized directly observed treatment short course drugs regimens and proper case management to ensure completion of treatment, cure and minimized defaulters and drug resistance [1]. Treatment regimens consist of two phases: initial intensive phase and continuation phase. The five essential anti TB drugs are potent antibiotics and are Isoniazid(H), Rifampicin®, Pyrazinamide(Z), Ethambutol(E) and Streptomycin(S).

Contact tracing is a main element of TB Prevention and Control Program. This Policy is maintained by National programme for TB control. The timing and notification of contacts, is done by using Section 71 of the Public Health Act; and revision of the procedure for airline contact screening [2-4].

Contact tracing will help to find contacted asymptomatic members of family and workplace, and detection of extra PTB patients, and childhood TB patients. After exposure to TB patients, 1-2% contacts will develop TB in their life time though third of contacts will be infected.

There are several studies carried out in the world regarding contact tracing of TB patients, in Sri Lanka, in 2006, a similar study was done in Kalutara district, but the contact tracing status are poor and only 17% of the contacts were covered.

Several similar studies done around the world include a study done in South Delhi, India to detect incidence and prevalence among household contacts of PTB patients [5]. A study done in Vietnam as contact investigation in Tuberculosis household patients in Hanoi [6].

In Malaysia, tracing of contacts of TB patients were done by Atif and his team [7] and they have concluded that the contact tracing status are poor in their country, same results given by most of the studies done on this topic around the world, thus making it a global problem.

## Objectives

### General Objectives

- To determine effectiveness of contract tracing activities of PTB, patients at Gampaha, District, Sri Lanka.

### Specific Objectives

- To determine PTB index patient and health care workers behavior towards the trace contracts.
- To determine socio demographic factors of PTB index patients at Gampaha District.
- To describe health care workers involvement of Contract tracing.
- To described details of contact investigation.

## Research Methodology

### Study design

A descriptive cross-sectional study of assessing pulmonary tuberculosis index patients contract tracing activities in the district of Gampaha.

### Study period

01 January 2018 to 01 March 2018.

### Study setting

The study was conducted in district chest clinic Gampaha, under which there are five branch clinics held at General Hospital Wathupitiwala, Gampaha, Negombo, Distict Hospital Dompe and Prisoners house Mahara. These are administrated under the national programme of Tuberculosis control and Chest Diseases.

### Sample size

Random selection of every other patient out of 107 new PTB patients, thus 51 index patients were taken for the study.

### Study population

New Pulmonary TB patients at completion of course ATT for two months after receiving treatments from the District Chest Clinic, awaiting continuation phase. Transferred patients extended initiation phase more than two months and relapse patients were excluded.

### Study subjects

Contact definition- A person who has been in close physical proximity to a TB patient.

### Study instruments

An interviewer administered questionnaire with a combination of open and closed ended questions was used.

### Administration of questionnaire

Data collectors are principal investigator and Medical record

officer in Chest clinic, who were trained on administration of questioner in two session.

### Pre – testing of questionnaire

Pre testing was done for accessibility, comprehensive sequence and case of administration in PTB patients.

### Ethical considerations

Informed consent was obtained from all the index PTB patients, ensuring the confidentiality of the information to be collected by them. The ethical clearance was obtained from Hospital ethical committee of National Hospital for Respiratory Diseases.

### Data processing and analysis

All the questionnaires were mainly checked for completeness and recording errors, followed by standard analysis of the data.

## Results

Total number of mid-year population in Gampaha District was 2294641 in the year 2013 and among them new PTB patients were 161 in 1st quarter of year 2014 and study population was 51, every other patient of 107 new PTB patients. According to the socio demographic data collected, following results were obtained.

The age range of the index patients was 11 to 70 years with a mean male age of 47.66 years and mean female age of 45.37 years. 80% of the patients were within the economically productive age group. Of the PTB patients, 70% were married and 92% were Sinhalese, 80% patients were Buddhists, 27% of PTB patients were not formally educated and only 3% were educated up to A/L. 32% PTB patients are unemployed (**Figure 1**). 60% of PTB patients were sputum smear positive. PTB index patients were educated by all the health care workers, majority being nurses. Health care workers have explained more than 80% of all the contact categories including family members, co-workers and roommates.

### Contact tracing information

Health care workers were directly involved in family contacts education, yet none of the co-workers or roommates were informed (**Table 1**). 97% of family members were informed by index patients. Yet none of the co-workers were informed by index patients. Out of all 772 contacts, 55.9% were family members, 33.1% were co-workers, 11% were roommates. Out of the 398 family members (55.9%), 33.6% were below 14 years, 88.3% were adults, 0.1% were pregnant and 0.5% were over 70 (**Table 2**).

### Contact investigations of family members

Out of all family contacts, only 165 were came for investigation and below 5 years it was 74% and above 5 years, 40%. Out of 17 below 5 years children contacted, only 11 came for investigations and 7 children were started on prophylactic treatments. None of the co-workers or roommates was investigated (**Table 3**).

Classification PTB vs. Sputum Result

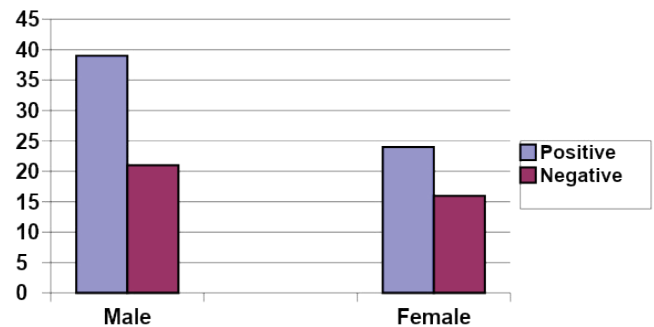


Figure 1 Sputum positivity.

Table 1 Healthcare worker directly informed to contacts.

Family members		Co-workers		Roommates	
Yes	No	Yes	No	Yes	No
93%	07%	00%	100%	00%	100%

Table 2 Index patients informed their contacts directly.

Family members		Co-workers		Roommates	
Yes	No	Yes	No	Yes	No
97%	03%	00%	100%	01%	99%

Table 3 Family contacts.

Investigation	0-5 yrs	%	Above 5 yrs	%
Mantoux	06	33	01	0.2
CXR	09	50	137	36
Sputum AFB	00	00	121	31
No of Co. In.	11	74	154	40

## Discussion

There are several key important factors to highlight in this discussion. The main target is to discuss the socio demographic factors of PTB index patients at Gampaha district. According to the data collected, 80% patients were in the economically productive age group, most were married, only 3% of the patients were educated up to A/L, yet most of them were employed. Considering the PTB index patient and health care workers behavior towards tracing contacts, the health care workers have explained more than 80% of all the contact categories including family members, co-workers and roommates. The patients were adequately educated by all the health care workers, majority being nurses. Though the health care workers were directly involved in family contacts education, none of the co-workers or roommates were informed. 97% of the Index patients have informed their family members, yet none of the co-workers or roommates were informed, probably due to stigma.

However, it is important to highlight that only out of the 398 family members informed, only 165 have come for investigations. So, with all the information gathered, it is obvious that the effectiveness of contact tracing activities of PTB patients should be improved.

As there were no similar studies carried out in Sri Lanka, the study was compared with studies done in India and other developed countries [8-15]. 50 of PTB patients had total contacts of 398 people and out of them 55.9% were family contacts, 33.1% coworker contacts and 11% were roommates. According to this half of the contacts were neglected by health care workers and PTB index patients.

Description about family contacts 4.3% were below 5 years in Sri Lanka below 5 years population 7.2%. According to the Register General Department under 5 years morbidity rate 16.3. According to this 4.3% contacts are at risk. And it is important to highlight that none of the co-workers or roommates were investigated by health care workers [16-19].

## Conclusion

Economically active age group is affected by PTB and most of them were males. Most of PTB patients had low level of education and unskilled occupation. Most of PTB index patients were sputum smear positive so that they will spread the disease. However, all the health care workers have educated PTB patients satisfactorily

though they have not made an effort to trace work place contacts. PTB index patients were concerned only about their family members and co-workers and roommates were not informed due to stigma. Surprisingly, contact investigations were not given any positive result in the adults. Below 5 Years age group contacts were started on prophylactic treatments, yet not a satisfactory amount (only 40%). Also, the family contacts were not motivated satisfactorily for investigations by health care workers. So, with this information gathered, certain recommendations can be suggested. There should be a motivational programme for health care workers to trace contacts, not only in Gampaha district but all over the country. There should be a policy or act to trace contacts periodically and the health ministry should have a collaboration programme between ministry of labour and ministry of health to trace work place contacts. More importantly there should be a standard screening protocol for family members and allocation of money for contacts to investigate and educate at field.

## Conflict of Interest

Author declares no conflict of interest.

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