



# Changes in the knowledge about TB among adults living in the urban slums of Bengaluru

Results from two cross-sectional surveys



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The photographs included in this report are of THALI's various community engagement activities and do not represent field activities carried out during the surveys.



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# CONTENTS

Tables & Figures	ii
Acronyms	iv
Foreword	vi
Acknowledgements	vii
<b>01 Introduction</b>	<b>1</b>
Background.....	2
Community Engagement .....	2
<b>02 Study design</b>	<b>4</b>
Project evaluation.....	5
Objective of the study .....	5
Study design .....	5
Data collection .....	6
Sample coverage .....	7
<b>03 Profile of the survey respondents</b>	<b>8</b>
Profile of the survey respondents.....	9
Household amenities.....	10
Source of information on health.....	12
Type of health facility accessed .....	13
Reasons for not going to a public health facility .....	14
Availability of health insurance.....	14
Personal habits.....	15
<b>04 Knowledge about key aspects of TB</b>	<b>16</b>
Knowledge about key aspects of TB.....	17
Exposure to THALI program.....	29
<b>05 Program implications and recommendations</b>	<b>32</b>
Effect of THALI program exposure on knowledge of TB.....	33
Limitations of the study.....	35
Key changes noticed.....	35
Program implications and recommendations.....	36
Conclusions.....	36
<b>06 Annexure</b>	<b>37</b>

# TABLES & FIGURES

- Table 1:** Sample coverage details of households selected for the knowledge survey in the baseline and end-line surveys, Bengaluru
- Table 2:** Percentage distribution of adults according to selected background characteristics in the baseline and end-line surveys, Bengaluru
- Table 3:** Percentage distribution of adults according to selected household amenities in the baseline and end-line surveys, Bengaluru
- Table 4:** Percentage distribution of adults by sex, according to source of health-related information in the baseline and end-line surveys, Bengaluru
- Table 5:** Percentage distribution of adults by sex, according to type of health facility from where their household members mainly get treatment in the baseline and end-line surveys, Bengaluru
- Table 6:** Percentage distribution of adults by sex, according to the reasons for not getting treatment from a government health facility in the baseline and end-line surveys, Bengaluru
- Table 7:** Percentage distribution by sex of adults having different types of health schemes/insurance coverage in the baseline and end-line surveys, Bengaluru
- Table 8:** Percentage distribution of adults by sex, according to personal habits such as smoking cigarettes and drinking alcohol in the baseline and end-line surveys, Bengaluru
- Table 9:** Percentage distribution of adults by sex, according to the reported disease condition if a person has persistent cough for two weeks or more in the baseline and end-line surveys, Bengaluru
- Table 10:** Percentage distribution of adults who knew or had heard about TB, according to selected characteristics in the baseline and end-line surveys, Bengaluru
- Table 11:** Percentage distribution of adults persons by sex, according to the source of information on TB (among those who knew or had heard about TB), in the baseline and end-line surveys, Bengaluru
- Table 12:** Percentage distribution by sex of adults, according to reporting of the most common symptom of lung TB in the baseline and end-line surveys, Bengaluru
- Table 13:** Percentage distribution of adults by sex, according to knowledge of the mode of transmission of TB from one person to another in the baseline and end-line surveys, Bengaluru
- Table 14:** Percentage distribution of adult CS persons according to sex who reported different ways to prevent the spread of TB within family or community in the baseline and end-line surveys
- Table 15:** Percentage distribution by sex of adults who reported specific confirmatory tests for TB in the baseline and end-line surveys, Bengaluru
- Table 16:** Percentage distribution of adults by sex according to the place where adults can be tested for TB, in the baseline and end-line surveys, Bengaluru

- Table 17:** Percentage distribution of adults by sex, according to the place where treatment for TB is available in the baseline and end-line surveys, Bengaluru
- Table 18:** Percentage distribution of adults by sex, according to the cost and duration of treatment for TB in the baseline and end-line surveys, Bengaluru
- Table 19:** Percentage distribution of adults by sex, according to their opinion on statements that “TB is fully curable” and “all TB patients need admission in hospital for treatment” in the baseline and end-line surveys, Bengaluru
- Table 20:** Percentage distribution by sex of adults, according to whom a TB patient should disclose that he/she has TB (among those who knew or had heard about TB) in the baseline and end-line surveys, Bengaluru
- Table 21:** Percentage distribution of adults by sex, according to reasons for disclosing one’s TB status (among those who said that a person should disclose his/her TB status) in the baseline and end-line surveys, Bengaluru
- Table 22:** Percentage distribution of adults by sex, according to persons to whom one should not disclose one’s TB status (among those who knew or had heard about TB) in the baseline and end-line surveys, Bengaluru
- Table 23:** Percentage distribution of adults by sex, according to reasons for non-disclosure of one’s TB status (among those who reported that one should not disclose one’s TB status) in the baseline and end-line surveys, Bengaluru
- Table 24:** Percentage distribution of adults who had comprehensive knowledge on TB, according to selected characteristics in the baseline and end-line surveys, Bengaluru
- Table 25:** Percentage distribution of adults by sex who had seen various types of IEC materials in the end-line survey, Bengaluru
- Table 26:** Percentage distribution of adults by sex, according to the place where or the person with whom they had seen the IEC materials (among the persons who had seen the IEC materials), Bengaluru
- Table 27:** Percentage distribution of adults by sex, according to the information received from the IEC materials (among persons who had seen the IEC materials), Bengaluru
- Table 28:** Percentage distribution of adults by sex who were exposed to various community engagement activities in the end-line survey, Bengaluru
- Table 29:** Percentage distribution of adults according to the exposure to THALI community activities in the end-line survey, using the pooled data from Bengaluru and Hyderabad
- Table 30:** Average effect of exposure of in-person contact, IEC materials and small or large group TB meetings on comprehensive knowledge, pooled data for Bengaluru and Hyderabad

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## Figures

- Figure 1:** Percentage of adults with comprehensive knowledge and its components
- Figure 2:** Percentage of adults who had comprehensive knowledge on TB according to exposure to specific community activity

# ACRONYMS

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<b>AWW</b>	Anganwadi Worker
<b>ATT</b>	Anti-Tuberculosis Treatment
<b>BL</b>	Base-line
<b>BBMP</b>	Bruhat Bengaluru Mahanagara Palike
<b>BPL</b>	Below Poverty Line
<b>CBO</b>	Community Based organization
<b>CBNAAT</b>	Cartridge Based Nucleic Acid Amplification Test
<b>CC</b>	Community Coordinator
<b>CHW</b>	Community Health Worker
<b>CMIS</b>	Computerized Management Information System
<b>CS</b>	Chest Symptomatic (person with symptoms of pulmonary TB)
<b>DMC</b>	Designated Microscopy Centre
<b>DOT</b>	Directly Observed Treatment
<b>DBT</b>	Direct Benefit Transfer
<b>FLW</b>	Front-line Workers / Field Level Workers
<b>EL</b>	End-line
<b>GoI</b>	Government of India
<b>HIV</b>	Human Immunodeficiency Virus
<b>IERB</b>	Internal Ethics Review Board
<b>IEC</b>	Information Education and Communication
<b>IPC</b>	Inter-personal Communication
<b>ICT</b>	Information Communication Technology
<b>JD</b>	Joint Director
<b>KHPT</b>	Karnataka Health Promotion Trust

<b>MDR</b>	<b>Multi-drug Resistant (TB)</b>
<b>NGO</b>	<b>Non-government Organization</b>
<b>NSP</b>	<b>New Smear Positive</b>
<b>NTEP</b>	<b>National Tuberculosis Elimination Programme</b>
<b>ORW</b>	<b>Outreach Workers</b>
<b>PCS</b>	<b>Prevention, Care and Support card</b>
<b>PRAD</b>	<b>Patient Referral and Diagnosis</b>
<b>PPS</b>	<b>Probability Proportion to Size</b>
<b>PSG</b>	<b>Patient Support Group</b>
<b>PSU</b>	<b>Primary Sampling Unit</b>
<b>SSM</b>	<b>Sputum Smear Microscopy</b>
<b>STCI</b>	<b>Standards for TB Care in India</b>
<b>TB</b>	<b>Tuberculosis</b>
<b>TBAI</b>	<b>TB Alert India</b>
<b>THALI</b>	<b>Tuberculosis Health Action Learning Initiative</b>
<b>TU</b>	<b>Tuberculosis Unit</b>
<b>USAID</b>	<b>United States Agency for International Development</b>

# FOREWORD



**GOVERNMENT OF KARNATAKA**  
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## FOREWORD

The Honorable Prime Minister announced the commitment to End TB by 2025, five years ahead of the Sustainable Development Goals deadline. The Government of India has scaled up basic TB diagnostic and treatment services in the public health system and strengthened partnerships with the private sector, resulting in the notification of more than 2.4 million TB patients in the year 2019.

Individuals with symptoms of TB need to seek appropriate facility-based healthcare services at the right time and from the right place. This is the first step in identification of persons with TB. An individual's knowledge, attitudes and perceptions about TB influence his/her health-seeking behaviour. These factors influence his/her understanding of the diagnosis, and readiness to start and adhere to treatment. Thus, it is important to understand the levels of knowledge and health seeking behaviour for TB among the general population, as well as among persons who have recently had or currently have symptoms suggestive of TB, especially among TB vulnerable populations such as the urban poor. As a part of Tuberculosis Health Action Learning Initiative (THALI) initiative (2016-2020), funded by the United States Agency for International Development (USAID), the Karnataka Health Promotion Trust (KHPT), Bengaluru, conducted baseline and end-line studies among adults living in the selected slum areas of Bengaluru and Hyderabad to assess the levels of TB knowledge and health seeking behaviour and their changes over the project period. The study also examines the effect of exposure to THALI's community engagement activities on knowledge and health seeking behaviour among adults living in the urban slum areas.

Field investigators were trained, recruited and supervised by KHPT to gather data for the assessment from consenting adults residing in the urban slum areas of Bengaluru and Hyderabad cities. The sample of 480 individuals, one from each of the 480 households, was selected from 60 slum areas identified through probability proportionate to estimated population size. In addition, adults from the same geography who reported having a persistent cough during the past six months, were interviewed for their knowledge and health seeking behaviour in relation to symptoms suggestive of TB. Regulatory and ethics approval were provided by the State TB Offices and the Institutional Ethics Committee of St John's Medical College and Hospital, Bengaluru, respectively.

This report is prepared by the KHPT, Bengaluru. The findings from the study will help programme managers to plan focused communication activities and develop specific messages for people who are most vulnerable to TB. This will aid in TB prevention and control activities among the urban poor in Hyderabad, Bengaluru and across other cities in India.

  
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The baseline and end-line study on “Knowledge about TB among adults living in the urban slums of Bengaluru” was successfully completed due to the efforts and involvement of numerous organizations and individuals at different stages of the survey. To the extent possible, we would like to thank everyone who was involved in the successful completion of the study.

First of all, we are grateful to USAID, India for funding this study as a part of the evaluation of the Tuberculosis Health Action Learning Initiative (THALI). THALI aims to establish a holistic approach to TB control in select Indian cities through the implementation of TB prevention activities and patient-centric models of care and support. We gratefully acknowledge the continuous guidance and support from the various staff of KHPT in Bengaluru throughout the study process and preparation of the report. Our heartfelt thanks goes out to the Institutional Ethics Committee of St. John’s Medical College and Hospital, Bengaluru, for approving the study. We are thankful grateful to the State TB Officer and Joint Director, Karnataka State, District TB Officers of Bengaluru Urban and Bengaluru City and State and District NTEP staff for extending their support. Special thanks go out to the local officials in the sample areas for facilitating data collection. We would also like to acknowledge the efforts of the local leaders of the selected areas, without whose support we would not have been able to complete the survey.

We thank the THALI project outreach workers for their hard work in conducting the initial mapping of slum areas. This mapping helped us to create the sampling frame for the study. Thanks are also due to the program field staff for establishing the link between local NTEP staff and the study team. We acknowledge the hard work put in by the study coordinator for the baseline survey. The end-line survey was carried out by Karvy Insights and we appreciate the efforts of the field staff of the organisation who were involved in the study. We also acknowledge with gratitude the hard work put in by the field supervisors and field interviewers in collecting the baseline and end-line survey data.

Finally, we acknowledge the participation of all the respondents of the study, the women and men of Bengaluru, who gave their time and responded to the lengthy questionnaires with tremendous patience and without any expectation from the study team.

01

# INTRODUCTION



## Background

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The KHPT-led Tuberculosis Health Action Learning Initiative (THALI) is a four-year (2016-2020) patient-centred, family-focused TB prevention and care initiative supporting vulnerable people in gaining access to quality TB care services from healthcare providers of the patient's choice. The project is implemented in Karnataka by KHPT and in Telangana and Andhra Pradesh by TB Alert India (TBAI). In the first two years of implementation, KHPT and TBAI worked in collaboration with the National Tuberculosis Elimination Programme (NTEP) and focused on behavior change among two target groups: (1) people living in urban slums, and (2) private healthcare providers in Bengaluru and Hyderabad cities.

The project underwent a strategic shift in the third and fourth years. Under the refined strategy, THALI worked with and through, (1) communities, especially key populations affected by TB, and (2) state and local governments and program managers of NTEP. The direct engagement with private sector healthcare providers was gradually discontinued in August 2017. Besides Bengaluru and Hyderabad cities, in the third and fourth years, the project expanded to cover additional geographies and population. The project coverage increased from about 3 million in two cities to a total population of 31 million people in 13 districts of Karnataka, 9 million people in 5 districts of Telangana and 14 million people in 3 districts of Andhra Pradesh.

### Implementation approach contents

**THALI's implementation approach is based on 5 principles in order to prevent and control TB in the project geographies.**

- 1. Appropriate health-seeking behavior of people with TB symptoms:** People recognize early symptoms and signs of TB, know where to seek care, and demand microbiological testing for TB diagnosis and quality services;
- 2. Evidence-based diagnosis:** All persons with symptoms of TB are prescribed the best available and affordable microbiological tests to establish definitive diagnosis. These tests are done at certified, quality-assured laboratories;
- 3. Standard, evidence-based treatment:** Standard anti-TB regimens are used to treat new TB patients presumed to be drug sensitive. Previously-treated TB patients and those exposed to drug-resistant TB are initiated on tailored treatment regimens, after drug sensitivity testing;
- 4. TB notification:** All TB patients diagnosed and initiated on treatment by clinical providers, and all patients tested microbiologically positive for TB at laboratories, are notified to public health authorities;
- 5. Treatment follow through:** All TB patients initiated on TB treatment are counselled, monitored and supported for treatment adherence, completion and prevention of spread of the disease.

The above mentioned 5 principles are envisaged to promote demand creation, service delivery and public health support systems, and are aligned well with global and national strategies for TB elimination.

## Community engagement

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The THALI project's field level activities mainly included engagement with the communities living in the slum areas of the cities of Bengaluru and Hyderabad. A cadre of Community Health Workers (CHWs) supervised by Community Coordinators (CCs) carried out these activities through consistent and systematic outreach. This team of dedicated frontline workers began community engagement activities in September 2016 in the areas under the Bengaluru Urban DTC and Bengaluru City (BBMP) DTC. The Community Health Workers' (CHWs) activities continued until May 2019 in Bengaluru City (BBMP) DTC; and until September 2019 in Bengaluru Urban DTC. CHWs, Community engagement was initiated through a slum entry program by conducting a slum map-

ping exercise in all the slums of Bengaluru city. According to the final mapping data, we identified 654 slums in Bengaluru city, catering to 3,26,474 households and 1.52 million populations within 24 TB units (TU).

The CHWs subsequently conducted Information Education and Communication (IEC) campaigns on TB in the community through in-person contacts, small group meetings, large group meetings and school education programs, and were involved in active case finding campaigns conducted by the government. Each CHW covered about 5-25 slum areas with a population ranging from 20000-32000 on an average. They were later aligned to geographies covered by the Designated Microscopy Centre (DMC). About 8-10 CHWs were supervised by a CC.

In addition, using a 'screening pathway', CHWs actively identified individuals with symptoms suggestive of TB after these IEC activities, and referred them for sputum testing to the DMC, a government facility which conducts sputum microscopy, and for CBNAAT testing (Cartridge Based Nucleic Acid Amplification Test). Any person having a persistent cough for more than 14 days and/ or having night sweats, sudden weight loss, blood in sputum, reduced appetite, persistent chest pain and enlarged lumps in the lymph nodes was identified as a TB symptomatic. The process of referral included filling up a form in triplicate and handing over two sputum cups with clear instructions of how and when to collect the sputum. If the individual could not go themselves to the DMC to hand over the samples for testing, the CHW would transport the sample for testing on behalf of the referred person. When a sample tested positive for TB, the CHW would accompany him/her to the public health facility for further counselling and treatment initiation. Following initiation of the TB treatment, the CHW followed up with the individual twice a month during the intensive phase and once a month during the continuation phase of treatment. During the follow-up visits, the CHWs provided family level counselling, adherence monitoring and support, nutritional advice, moral support, and support to obtain social entitlements, including the Government's direct benefit transfer (DBT) scheme providing each patient ₹500 per month. Information on DBT was collected after the introduction of the Nikshay Poshan Yojana scheme by the Government of India in the year 2018. In addition, all TB patients were motivated to attend patient support group (PSG) meetings from 2018. Patients' weights were monitored on a regular basis. They were referred for follow-up tests, counselled on behavior change when relevant, and referred for adverse drug reactions or side effects management. All inputs, including weight measurements, follow-up test results and treatment adherence were documented by the CHW with the supportive supervision of the CC, using a Patient Referral and Diagnosis (PRAD) form for referral, and a Prevention, Care and Support card (PCS) for treatment adherence support. The outcome of the TB treatment was recorded and validated by medical teams. Both forms, once filled, were verified for completeness by the CC, before entry into a computerized management information system (CMIS) on a regular basis.

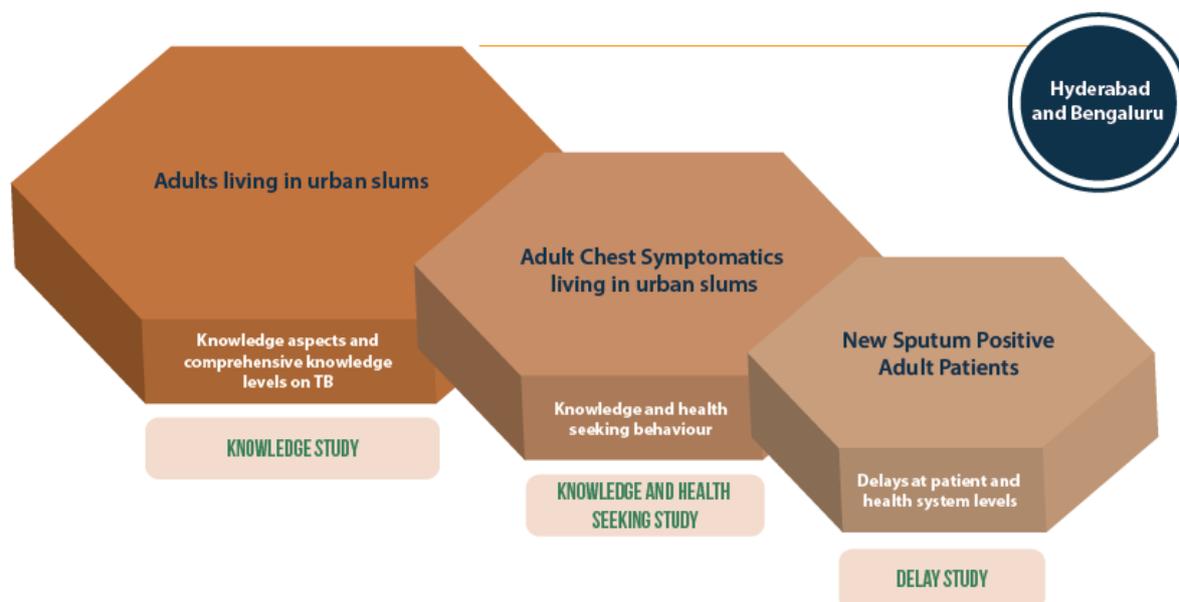
During the September 2016-June 2019 period, the CHWs in Bengaluru referred 17,914 symptomatic persons for diagnostic tests, out of which 13,819 persons underwent tests. Among the tested persons, 1234 persons were found to have TB and 1204 persons were started on TB treatment.

02

# STUDY DESIGN



# Project Evaluation



The overall project evaluation design included surveys among three target groups, namely adults living in slum areas of Hyderabad and Bengaluru cities, chest symptomatics in the urban slums and adult New Sputum Positive (NSP) TB patients accessing anti-tubercular treatment (ATT) in these two cities. The mentioned evaluation was implemented through baseline and end-line surveys conducted amongst the target groups mentioned above. The survey amongst the adults living the slum areas included knowledge aspects regarding TB, and we assessed the changes over time. The study among the chest symptomatics examined knowledge and health seeking behaviors as well as the changes over the time. The study among the adult NSP TB patients examined and assessed the various delays related to initiating ATT and compared the changes over time. This report pertains to the study conducted among the adults living in the urban slums in the Bengaluru Urban district.

## Objective of the study

The aim of the study was to assess the knowledge about TB among adults living in the urban slum areas. We also studied the level of key knowledge aspects of TB and the changes identified between baseline and end-line surveys. In addition, we also studied the extent to which respondents were exposed to the THALI program and the effect of the program exposure on comprehensive knowledge of TB.

## Study Design

We conducted the study in selected slum areas in Bengaluru Urban district. The sample frame consisted of the slum mapping data collected through the CHWs. We used the initial and final updated slum mapping data for the baseline and end-line surveys, respectively. For the baseline sample survey, the sample frame consisted of 637 urban slum areas in Bengaluru Urban district. Similarly, for the end-line survey, the sample frame consisted of 644 urban slum areas in Bengaluru Urban district. In both baseline and end-line surveys we included all urban slum areas with more than 40 households. We adopted a two stage sampling technique to collect the data. In the first stage we selected a total of 60 urban slums for both baseline and end-line surveys. We used Probability Proportion to Size (PPS) method to select the required number of urban slum areas. We arranged

urban slum areas according to the household size in ascending order and systematically selected the required number of slum areas. In the second stage, we conducted a systematic random selection of the required number of households for interviewing the adult persons within each of the selected slum areas. We conducted a household listing operation, which included screening of household members who had a cough of more than two weeks duration in the six months prior to the survey or were at the time having a persistent cough, in each of the selected urban slum areas. Large slum areas with 300-350 or more households were segmented, according to natural boundaries, into three or more segments (depending on the size of the slums) of approximately equal size (approximately about 125 households). From all the segments in each of the large slums, two segments were selected using systematic random sampling. House listing, as well as screening, was carried out only in the two selected segments in the large slum areas.

The target sample size was 480 adult persons with an average of 8 adult persons per slum area, based on an estimated sample size of 455. The sample size was calculated for a detection of a change of 10 percentage points in the knowledge aspects of TB over the project period from an assumed value of 50% with 95% confidence and 90% power, with a design effect of 1.5. Only one adult individual per selected household was interviewed. The field team interviewed the selected adults in the local language or any language that was spoken by the respondent.

## Data collection

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We recruited and trained field staff for five days. This included field practice sessions. The mandatory pre-fieldwork training session for the field staff included the procedures followed with respect to identifying the slum areas, segmentation procedures, screening of persons who had a persistent cough for more than two weeks, selection of segments and selection of households, and obtaining consent (and handling non-consent). We trained all the field staff to inform all the eligible respondents that their participation in the study was voluntary, to adhere to the study protocol and to ensure that the interviews were conducted in private places, where the study participant felt comfortable. We gave them clear instructions not to reveal the identity of the respondents to any third party. We trained them to maintain complete confidentiality of the recorded transcript and not to show the questionnaire to any other person. For the baseline, the recorded transcript was directly entered into the computer. Trained field investigators administered a semi-structured questionnaire to participants in the local language. For the end-line survey, we used a mobile application database to record responses. Before collecting the information, all the respondents provided written informed consent.

We designed the semi-structured questionnaire to collect information on background characteristics and the knowledge aspects regarding TB. In addition, in the end-line survey, we also asked questions to understand the exposure to the THALI program. We collected the baseline data between November 2016 and February 2017. and the end-line data between October 2019 and January 2020. In the end-line, in 41 slum areas, we selected 10 households for the knowledge survey. This is because, in the initial stage of the survey, the response rate was very low and in order to compensate for the high non-response, the number of sampled households was increased in the end-line survey.

KHPT's dedicated team of field investigators collected the baseline data. However, Karvy Insights, a private organization with experience in large-scale data collection, collected the end-line data. KHPT's research and technical teams trained staff for both the baseline and end-line surveys. The data analysis was carried out using Stata version 14.0.

## Sample coverage

We selected 480 and 562 households for the interview of adult persons in the baseline and end-line surveys. Out of the households selected, interviews with an adult member were completed for about 95% (458) and 88% (493) in the baseline and end-line surveys, respectively. Refusals for interview were higher in the end-line (6%) as compared to the baseline (4%). Even after repeated visits to the selected household, either no adult member was at home or the household was reportedly locked for 1% and 6% of the households in the baseline and end-line, respectively.

**Table 1: Sample coverage details of adult CS persons in the baseline and end-line surveys, Bengaluru**

Status of the survey	Baseline		End-line	
	Number of cases	Percent	Number of cases	Percent
Selected for interview	480	100	562	100.0
Completed	458	95.4	493	87.7
Refused	17	3.5	36	6.4
Not available	5	1.0	33	5.9

03

# PROFILE OF THE SURVEY RESPONDENTS



## Profile of the survey respondents

In both baseline and end-line surveys, we asked all the respondents to provide details of certain background characteristics. These results are provided in Table 2. We did not notice much change in the distribution of many of the characteristics of the respondents between baseline and end-line surveys. We noticed variations in the sex distribution of the respondents who were interviewed at baseline and end-line. The proportion of male respondents was comparatively higher in the baseline (35%) as compared to end-line (22%). The other difference that we noted was the status of literacy. Illiteracy increased from 24% to 30%, the proportion of persons who were engaged in jobs other than business or salaried employment in government or private sector increased from 34% to 43%, and the proportion of persons who were neither Scheduled Caste nor Scheduled Tribe decreased from 54% to 41%. We noted an increase in the reported household monthly income and monthly personal income in the end-line.

**Table 2: Percentage distribution of adults according to selected background characteristics in the baseline and end-line surveys, Bengaluru**

Characteristic	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
<b>Sex</b>						
Male					34.8	22.1
Female					65.2	77.9
<b>Age</b>						
< 40	49.2	52.4	68.5	65.9	61.8	62.9
40-59	39.7	36.1	25.8	27.5	30.6	29.4
60+	11.1	11.5	5.8	6.6	7.6	7.7
<b>Mean age</b>	<b>40.1</b>	<b>40.3</b>	<b>34.9</b>	<b>36.6</b>	<b>36.7</b>	<b>37.4</b>
<b>Marital status</b>						
Currently married	73.9	76.3	73.2	78.3	73.4	77.8
Marriage dissolved	5.7	15.9	17.3	13.7	13.3	71.0
Never married	20.4	17.6	9.5	5.9	13.3	8.5
<b>Literacy and education</b>						
Illiterate	21.2	24.6	25.5	31.5	24.0	30.0
Literate, 1-7 years of schooling	23.4	21.1	22.7	20.5	22.9	20.6
8+ years schooling completed	55.4	54.3	51.8	48.0	53.1	49.4
<b>Occupation</b>						
Business	21.0	12.7	3.7	4.6	9.7	6.4
Salaried job	15.9	10.4	6.5	6.2	9.8	7.2

Other job	53.7	65.5	24.1	35.9	34.4	42.5
Not working	9.4	11.3	65.6	53.3	46.1	44.0
<b>Religion</b>						
Hinduism	79.0	79.0	73.9	71.3	75.7	73.0
Islam	13.3	13.0	19.4	17.6	17.3	16.6
Other	7.7	8.0	6.7	11.2	7.0	10.5
<b>Caste/Tribe</b>						
Scheduled Caste	42.3	52.8	43.7	48.2	43.2	49.2
Scheduled Tribe	5.3	6.8	1.6	11.0	2.9	10.0
Others	52.4	40.5	54.8	40.8	54.0	40.7
<b>Personal monthly income (in ₹)</b>						
No income	9.4	13.8	65.8	51.6	46.2	43.2
<5000	6.6	3.4	11.5	11.3	9.8	9.6
5000+	81.8	81.1	20.5	36.5	41.9	46.4
Not mentioned	2.3	1.7	2.1	0.5	2.2	0.8
<b>Mean income</b>	<b>9513.2</b>	<b>11038.6</b>	<b>1911.5</b>	<b>3933.1</b>	<b>4557.1</b>	<b>5489.9</b>
<b>Household monthly income (in ₹)</b>						
< 5000	3.9	0.9	4.8	2.7	4.5	2.3
5000-14999	37.6	28.5	56.1	30.1	49.6	29.8
15000+	53.6	59.0	33.5	61.4	40.5	60.9
Not mentioned	5.0	11.5	5.7	5.8	5.4	7.0
<b>Mean household income</b>	<b>15700.0</b>	<b>18710.3</b>	<b>12912.3</b>	<b>17035.8</b>	<b>13887.9</b>	<b>17388.3</b>
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

## Household amenities

We collected information on the amenities available in the households. The results are presented in Table 3. We noted a change in the distribution between baseline and end-line surveys for some of the amenities. A higher proportion of respondents in the end-line as compared to baseline said that they lived in a house with three or more rooms (68% vs. 17%), lived in house with more than one room for sleeping (66% vs. 21%), had a BPL card (71% vs. 57%), and lived in a house having ventilation (66% vs. 22%). However, a slightly lower proportion of respondents in the end-line reported that they had mobile phones (91%) as compared to the baseline (97%), even though this amenity remained above 90% in both rounds of survey.

**Table 3: Percentage distribution of adults according to selected household amenities in the baseline and end-line surveys, Bengaluru**

Characteristic	Baseline	End-line
<b>Type of house</b>		
Kaccha	9.3	0.2
Semi-pucca	35.9	41.8
Pucca	54.8	58.0
<b>Number of rooms</b>		
1	31.4	8.4
2	51.4	23.8
3	13.9	54.6
4+	3.3	13.3
<b>Number of rooms used for sleeping</b>		
1	78.9	33.8
2	19.9	55.7
3	1.2	10.5
<b>Have BPL card</b>		
Yes	57.2	70.7
No	41.6	29.3
Don't know/Can't say	1.2	0.0
<b>House has window that can be opened</b>		
Yes	47.2	75.5
No	52.9	24.5
<b>Has ventilation facility</b>		
Yes	22.0	65.8
No	78.0	34.2
<b>Ownership of present house</b>		
Own house	55.6	61.8
Not own house	44.4	38.2
<b>Own a radio</b>		
Yes	5.8	6.6
No	94.2	93.4

Own a telephone		
Yes	3.6	1.9
No	96.4	98.1
Own a mobile		
Yes	97.2	91.1
No	2.8	8.9
Own a television		
Yes	94.0	93.0
No	6.0	7.0
<b>Total</b>	<b>100</b>	<b>100.0</b>
<b>Number of cases</b>	<b>458</b>	<b>493</b>

## Source of information on health

We enquired about the source of obtaining health-related information. We noted an increase in the proportion of respondents reporting that they generally get health-related information from government health workers between the baseline (16%) and end-line (40%) surveys. The most-frequently reported source of information on health in the baseline was television/radio (52%), followed by friends/relatives (25%), and newspapers and magazines (25%). In the end-line, the most-frequently reported sources changed, with television/radio (49%) retaining the first position, followed by government health workers (40%), and friends/relatives (28%). It is possible that respondents could have falsely identified THALI CHWs as government health workers, and due to this, there may have been a high proportion of respondents reporting that the government health worker was their source of information on health.

**Table 4: Percentage distribution of adults by sex, according to source of health-related information in the baseline and end-line surveys, Bengaluru**

Source of information	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Newspapers and magazines	17.3	24.6	13.5	14.6	15.4	18.8
Television/Radio	47.0	49.5	42.4	50.0	44.6	49.8
Billboards	4.5	1.8	0.5	2.0	2.4	1.9
Brochures, posters, other printed material	6.0	3.1	9.0	3.2	7.6	3.2
Health workers	23.0	39.8	15.4	44.4	19.1	42.5
NGO outreach workers	2.8	4.7	2.9	4.2	2.9	4.4
Community meetings	1.9	2.9	4.3	4.3	3.1	3.7

Video show in the community	0.5	0.9	1.4	1.2	1.0	1.1
Telephone helpline	1.9	7.1	1.5	9.5	1.7	8.5
Friends/relatives	24.4	23.0	17.6	29.1	20.9	26.6
Other	29.1	25.2	35.7	23.7	32.5	24.4
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

## Type of health facility accessed

In both baseline and end-line surveys, we enquired about the type of health facility where the household members of the respondent usually go for treatment. There was a slight change in the type of health facility that was usually accessed by the members of the respondent's household (See Table 5). For example, 46% of the respondents in the baseline said that the members of their household usually go to a public health facility for treatment. This reduced to 34% in the end-line survey. The proportion of household members usually accessing a private facility remained high and more respondents in the end-line were reported to have accessed a private facility (61%) than in the baseline (52%).

**Table 5: Percentage distribution of adults by sex, according to type of health facility from where their household members mainly get treatment in the baseline and end-line surveys, Bengaluru**

Type of health facility	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Government/Municipal Hospital	46.1	35.4	41.7	25.6	43.2	27.8
Government dispensary	4.2	3.5	2.4	3.2	3.0	3.3
Other public sector health facility	0.0	2.9	0.0	3.0	0.0	3.0
NGO/Trust hospital/clinic	1.1	0.0	2.0	0.3	1.7	0.2
Private hospital	40.0	11.2	43.7	12.1	42.4	11.9
Private doctor/clinic	8.0	44.8	9.9	50.7	9.2	49.3
Other private sector health facility	0.7	0.0	0.0	0.0	0.2	0.0
Pharmacy/Drug Store	0.0	2.3	0.0	2.4	0.0	2.4
Home treatment	0.0	0.0	0.0	1.7	0.0	1.4
Other	0.0	0.0	0.3	1.0	0.2	0.8
<b>Total percent</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

## Reasons for usually not going to a public health facility

We asked all the respondents who reported that their household members usually do not access a public health facility for their reasons. In the end-line survey, the most frequently reported reasons were distance to the facility (43%), poor quality of care (27%), longer waiting times (25%), and inconvenient facility timings (22%) (see Table 6). We noted the same kind of response in the baseline as well, the most frequent responses being distance to the facility (50%), followed by long waiting times (28%), poor quality of care (26%) and inconvenient facility timings (20%).

**Table 6: Percentage distribution of adults by sex, according to the reasons for not getting treatment from a government health facility in the baseline and end-line surveys, Bengaluru**

Reasons	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Facility is far away	51.1	42.4	48.7	42.5	49.5	42.5
Facility timing not convenient	23.6	21.2	17.8	22.6	19.7	22.3
Health personnel often absent	18.9	12.1	11.1	11.1	13.6	11.3
Waiting time too long	29.6	22.7	26.4	24.9	27.5	24.5
Poor quality of care	25.2	22.7	25.8	28.4	25.6	27.2
No reason	2.7	16.7	9.1	16.1	7.1	16.2
Other	7.1	9.1	6.0	4.2	6.4	5.2
<b>Number of cases</b>	<b>79</b>	<b>63</b>	<b>167</b>	<b>262</b>	<b>246</b>	<b>325</b>

## Availability of health insurance

We asked all the adults persons about the details of their health insurance coverage and that of their family members. We noted that the health insurance coverage increased between baseline and end-line surveys (see Table 7). For instance, in the baseline, only 19% of the adults reported that they had a health insurance scheme. This increased to 77% in the end-line. The increase cut across gender and was mostly due to the increase in coverage of the Ayushman Bharat - Arogya Karnataka state insurance scheme. A greater proportion of respondents reported that they had more than one insurance scheme during the end-line (an increase from 2% in the baseline to 12% in the end-line survey).

**Table 7: Percentage distribution by sex of adults having different type of health scheme/insurance coverage in the baseline and end-line surveys, Bengaluru**

Name of health scheme/ insurance	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Employees State Insurance Scheme	12.9	6.4	10.7	3.1	11.4	3.8
Central Government Health Scheme	1.8	2.7	2.4	1.5	2.2	1.8
State Health Insurance Scheme	2.6	69.5	2.0	74.2	2.2	73.2
Rashtriya Swasthya Bima Yojana	2.5	3.9	2.1	5.3	2.2	5.0

Community Health Insurance Program	0.6	1.9	0.0	2.0	0.2	2.0
Other health insurance through employer	1.3	3.5	0.0	2.1	0.4	2.4
Medical reimbursement from employer	1.3	0.0	0.5	0.0	0.8	0.0
Other privately purchased commercial health insurance	0.5	1.6	1.6	0.8	1.2	1.0
Other	1.3	0.0	0.3	0.9	0.6	0.7
No health scheme/ insurance coverage	78.2	25.8	83.0	21.8	81.3	22.7
Have more than one insurance scheme	2.5	14.5	2.3	11.7	2.3	12.3
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

## Personal habits

We asked all respondents about their personal habits such as consumption of tobacco and alcohol. Males reported these habits more frequently. We noticed a reduction in these habits, particularly for smoking of cigarettes or bidis (see Table 8) between baseline and end-line surveys. In the baseline, 61% of the males reported that they never smoked and this increased to about 71% in the end-line. Similarly, we noticed a reduction in males who reported that they consumed alcohol about once in week between baseline and end-line surveys.

**Table 8: Percentage distribution of adults by sex, according to personal habits such as smoking cigarettes and drinking alcohol in the baseline and end-line surveys, Bengaluru**

Personal habits	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
<b>Smoke cigarettes/bidis</b>						
Current smoker	31.8	20.2	1.0	0.3	11.8	4.7
Past smoker	7.6	9.1	1.0	0.0	3.3	2.0
Never smoked	60.6	70.7	97.9	99.7	84.9	93.3
<b>Drink alcohol</b>						
Almost every day	11.4	9.5	0.0	0.0	4.0	2.1
About once a week	19.7	13.4	1.6	0.3	7.9	3.2
Less than once a week	9.7	9.5	0.9	0.0	4.0	2.1
Never	59.2	67.6	97.5	99.7	84.2	92.6
<b>Total percent</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

# 04

## KNOWLEDGE ABOUT KEY ASPECTS OF TB



## Knowledge about key aspects of TB

We asked all the adults various questions to assess their knowledge about TB, such as what are the symptoms of lung TB? How does it spread from one person to another? How can one prevent TB? What are the methods of confirmation of TB? What is the duration of treatment? We first enquired about what the probable disease condition could be if a person was suffering from a persistent cough for two weeks or more. The results are presented in Table 9. We identified a reduction in the proportion of respondents who reported that the disease condition could be TB. In addition, in the end-line survey, other frequently reported disease conditions were seasonal cold (41%) and throat infection (35%). About 20% and 15% of the respondents in the baseline survey reported seasonal cold and throat infection, respectively. However, the proportion of respondents who did not know or couldn't say reduced between baseline (13%) and end-line surveys (4%).

**Table 9: Percentage distribution of adults by sex, according to the reported disease condition if a person has persistent cough for two weeks or more in the baseline and end-line surveys, Bengaluru**

Disease condition	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Throat infection	23.0	32.9	10.3	35.8	14.7	35.1
Seasonal cold	21.2	33.6	18.7	43.7	19.6	41.4
Viral fever	9.3	11.2	9.7	8.9	9.5	9.4
Tuberculosis	31.8	33.7	44.7	33.5	40.2	33.5
Pleurisy	1.3	5.1	1.5	4.1	1.4	4.4
Chest Congestion	2.5	1.7	3.4	1.3	3.1	1.4
Asthma/COPD	8.5	11.9	9.7	8.7	9.3	9.4
Others	7.2	25.2	5.2	15.5	5.9	17.7
Don't know/Can't say	13.9	3.7	12.6	3.8	13.0	3.8
<b>Total percent</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

We also examined the proportion of adults who knew or had heard about TB, according to various background characteristics, and the results are presented in Table 10. We noticed that there was a significant increase in proportion of respondents who knew or had heard of TB between baseline and end-line surveys for most of the background characteristics examined. Overall, the proportion of respondents who knew or had heard of TB significantly increased from 79% in baseline to 86% in the end-line survey. The increase in knowledge level was significant for females, among those aged less than 40 years, currently married people, illiterate people, those who had completed more than eight years of schooling, unemployed persons, non-Hindus, irrespective of caste/tribe, and among those whose monthly income was less than ₹5000 and whose household income was less than ₹15000. Baseline levels were high (>70%) for all the remaining categories, except the elderly where the numbers surveyed were also small.

**Table 10: Percentage distribution of adults who knew or had heard about TB, according to selected characteristics in the baseline and end-line surveys, Bengaluru**

Characteristic	Baseline		End-line		p-value
	Percent	Number of cases	Percent	Number of cases	
<b>Sex of the respondent</b>					
Male	77.7	160	85.3	109	0.125
Female	79.8	298	86.3	384	0.026
<b>Age (in years)</b>					
< 40	79.7	283	87.3	310	0.014
40-59	80.9	140	86.2	145	0.231
60+	66.5	35	75.2	38	0.414
<b>Marital status</b>					
Currently married	80.9	336	87.8	384	0.011
Widowed/Divorced/Separated	72.2	61	74.5	67	0.771
Never married	76.1	61	88.8	42	0.113
<b>Literacy and education</b>					
Illiterate	62.2	110	75.4	148	0.023
Literate, 1-7 years of schooling	77.2	105	90.1	102	0.015
8+ years of schooling	87.6	243	90.8	243	0.251
<b>Occupation</b>					
Business	86.0	45	91.3	32	0.483
Salaried job	84.4	45	94.7	35	0.163
Other job	74.0	158	81.8	209	0.075
Not working	80.3	210	88.0	217	0.031
<b>Religion</b>					
Hinduism	79.6	347	84.0	360	0.128
Islam	76.5	79	89.7	82	0.029
Other	79.8	32	94.1	52	0.057
<b>Caste/Tribe</b>					
Scheduled Caste/Tribe	75.9	211	83.6	201	0.034
Others	81.8	247	89.6	292	0.021

Monthly income (in ₹)					
< 5000	77.6	266	85.5	264	0.020
5000+	81.2	192	86.7	229	0.124
Household monthly income (in ₹)					
< 15000	76.4	273	84.1	193	0.043
15000+	83.1	185	87.3	300	0.200
<b>Total</b>	<b>79.1</b>	<b>458</b>	<b>86.0</b>	<b>493</b>	<b>0.005</b>

All the adults who reportedly knew or had heard about TB were asked about their source of information on TB. In the end-line survey, the top three sources of information were TB among friends or relatives (40%), word of mouth from friends or relatives (40%) and television or radio (37%). In the end-line, comparatively more females than males reported these as their sources of information. In the baseline survey too, the most frequently reported sources of information on TB were word of mouth from friends or relatives (45%), TB among friends or relatives (34%) and television or radio (30%). A comparatively higher proportion of respondents in the end-line (18%) reported that the DOTS provider or the government health worker was the source of information as compared to the baseline survey (4%), but this proportion still remains small.

**Table 11: Percentage distribution of adults persons by sex, according to the source of information on TB (among those who knew or had heard about TB), in the baseline and end-line surveys, Bengaluru**

Source of information on TB	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Television/ Radio	28.0	33.2	31.2	37.5	30.1	36.6
Newspaper/ Magazine	21.5	1.8	14.2	2.2	16.7	2.1
Posters/ Banners/ Hoardings/ Campaigns	7.0	5.3	4.8	3.1	5.5	3.6
Word of mouth from friends / relatives	38.3	36.4	47.9	40.7	44.6	39.7
TB among friends/relatives	35.6	38.7	33.6	40.8	34.3	40.4
DOTS provider/Health worker	4.5	14.1	3.7	19.5	4.0	18.3
Anganwadi worker	3.5	6.5	5.7	8.6	5.0	8.1
Community meetings	5.1	8.4	2.0	3.2	3.1	4.4
Workplace	7.2	5.2	2.0	2.3	3.8	3.0
Schools/ Teachers	1.6	5.7	2.4	4.9	2.1	5.1
Telephone helpline	0.0	2.6	0.4	1.9	0.3	2.1
Respondent had TB	1.5	4.5	0.5	1.1	0.8	1.8
Others	12.4	15.0	15.5	12.7	14.4	13.2
<b>Number of cases</b>	<b>124</b>	<b>93</b>	<b>238</b>	<b>331</b>	<b>362</b>	<b>424</b>

We asked all adults about the most common symptoms of lung TB. We found that there was an increase in the proportion of adults who reported that cough was the most common symptom of lung TB in the baseline (54%) and end-line (72%) surveys (see Table 12). Consequently, the proportion of respondents who could not say reduced between baseline and end-line surveys. The reporting of cough as the symptom was slightly higher among males than females in end-line survey; a reverse trend was found in the baseline survey.

**Table 12: Percentage distribution by sex of CS persons who reported the following most common symptoms of lung TB, in the baseline and end-line surveys, Bengaluru**

Most common symptom of lung TB	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Cough	48.7	74.2	57.1	71.4	54.2	72.0
Fever	2.4	4.1	2.1	3.3	2.2	3.5
Night sweats	0.6	0.0	0.6	0.4	0.6	0.3
Weight loss	13.2	2.9	11.7	5.9	12.2	5.3
Weakness	5.4	1.4	1.7	0.3	3.0	0.5
Chest pain	0.0	0.0	0.3	0.5	0.2	0.4
Others	0.0	2.8	0.3	4.4	0.2	4.1
Don't Know/Can't say	29.6	14.7	26.2	13.7	27.3	14.0
<b>Total percent</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

We asked adults about the mode of transmission of TB. We noticed a 10 percentage point increase in the response that TB is transmitted through the air when a person with TB coughs or sneezes, between baseline and end-line surveys (see Table 13). Consequently, the proportion of respondents who could not correctly respond on the mode of transmission of TB reduced between baseline and end-line surveys. Surprisingly, although there was an improvement in the correct response on the mode of transmission, there was also an increase in the proportion of incorrect responses such as food (20% vs. 29%) and stepping on sputum (8% vs. 25%) between baseline and end-line surveys.

**Table 13: Percentage distribution of adults by sex, according to knowledge of the mode of transmission of TB from one person to another in the baseline and end-line surveys, Bengaluru**

Mode of TB transmission	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Through the air when a person with TB coughs/ sneezes	60.7	72.3	62.6	72.0	62.0	72.0
Sharing utensils	6.7	6.6	9.5	11.7	8.5	10.6
Touching a person with TB	5.8	11.6	4.6	17.2	5.0	16.0
Food	13.5	28.6	23.2	29.4	19.8	29.2
Sexual contact	3.2	1.7	1.1	4.1	1.8	3.6
Mosquito bites	1.2	1.7	3.4	2.4	2.7	2.2
Stepping on sputum	7.6	24.8	8.5	24.7	8.2	24.7
Other	2.5	7.1	2.1	2.6	2.2	3.6
Don't know/Can't say	35.0	23.1	31.4	23.2	32.6	23.3
<b>Total percent</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

We asked adults about the different ways to prevent the spread of TB within the family or community. These results are presented in Table 14. We also noticed that more respondents in the end-line (28%) than in the baseline (11%) reported prompt diagnosis and treatment as a way to prevent the spread to TB. Surprisingly, there was a slight reduction in the reporting of covering mouth and nose while coughing as the way to prevent the spread of TB between baseline (49%) and end-line (38%) surveys. The reduction was comparatively higher for males (49% vs. 30%) than females (50% vs. 40%). However, a comparatively higher percentage of respondents in the end-line (41%) as compared to baseline (19%) reported that wearing a mask can prevent the spread of TB, an increase of about 22 percentage points. However, nearly one-third of the respondents in both baseline and end-line surveys did not know or could not state the ways to prevent the spread of TB.

**Table 14: Percentage distribution by sex of adults who reported different ways to prevent the spread of TB within family or community in the baseline and end-line surveys, Bengaluru**

Ways to prevent spread of TB	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Covering mouth and nose while coughing	49.1	30.4	49.5	39.8	49.4	37.7
Wearing a mask	23.3	38.0	16.6	41.6	18.9	40.8
Good ventilation	11.8	6.6	17.6	11.4	15.6	10.3
Prompt diagnosis and treatment	13.6	34.2	9.9	26.1	11.2	27.9
Vulnerable persons like children to take medicines to prevent TB	3.9	6.8	2.5	4.4	3.0	4.9
Good nutrition	12.6	14.4	10.2	11.7	11.0	12.3
Other	4.6	9.8	7.6	9.8	6.6	9.8
Don't know/Can't say	34.8	15.5	32.9	19.2	32.4	32.4
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

We asked respondents about the confirmatory test for TB. The results are provided in Table 15. We noticed a negligible reduction between baseline and end-line surveys in the proportion of respondents who said that the sputum test is the confirmatory test for TB. The proportion of respondents reporting other tests, such as chest X-Ray and blood test, was also reduced between baseline and end-line surveys. However, nearly half of the respondents still considered a blood test as the confirmatory test for the diagnosis of TB. We did not notice much difference in responses according to the sex of the respondents.

**Table 15: Percentage distribution by sex of adults who reported specific confirmatory tests for TB in the baseline and end-line surveys, Bengaluru**

Test reported	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
X-Ray of the chest	55.9	28.3	47.9	23.7	50.7	24.7
Sputum test	63.4	58.6	63.0	60.8	63.1	60.3
Blood test	61.5	48.3	65.3	52.6	64.0	51.7
Mantoux tuberculin/skin test	8.8	8.4	12.6	5.4	11.3	6.1
Tissue biopsy	9.5	6.8	7.8	6.6	8.4	6.6
Other test	5.6	0.0	8.1	0.0	7.2	0.0
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

We asked respondents whether they knew where adults could be tested for TB. The results are provided in Table 16. In both baseline and end-line surveys, a majority of the respondents mentioned a public health facility as the place where adults could be tested for TB. There was an increase in the proportion of respondents who said that the government TB hospital (29% vs. 34%) and other government hospitals (1% to 16%) were places where the test could be done. We did not observe much difference in responses according to sex. However, we noted that the proportion of respondents who did not know or couldn't say about the testing centres remained the same between baseline and end-line surveys.

**Table 16: Percentage distribution of adults by sex according to the place where adults can be tested for TB, in the baseline and end-line surveys, Bengaluru**

Place for TB testing	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Municipal Corporation hospital	52.7	46.9	53.8	47.0	53.4	47.0
Government TB hospital	33.4	33.9	27.2	34.6	29.4	34.4
Medical College	1.3	0.9	0.2	0.5	0.6	0.6
Other government hospital	0.7	14.7	1.7	15.9	1.4	15.7
Designated Microscopy Centre	0.0	3.5	1.2	2.3	0.8	2.6
Private hospital	13.1	19.6	19.0	15.8	17.0	16.7
Private clinic	2.9	2.2	2.5	1.7	2.6	1.8
Any private lab	2.9	8.6	1.5	2.7	2.0	4.0
Others	0.7	0.8	0.8	1.9	0.8	1.6
Don't know/Can't say	24.3	20.4	26.2	25.8	25.5	24.7
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

We asked respondents where treatment for TB was available. The results are shown in Table 17. In both baseline and end-line survey, most of the respondents mentioned the municipal hospital as the place where the treatment for TB was available. Similarly, the proportion of respondents who said that they did not know or could not say also remained the same. We did not notice much difference in the responses by sex, except regarding private facilities.

**Table 17: Percentage distribution of adults by sex, according to the place where treatment for TB is available in the baseline and end-line surveys, Bengaluru**

Place of treatment available	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Municipal Hospital	64.2	62.3	63.4	63.2	63.7	63.0
Government Dispensary	20.5	22.9	16.9	17.1	18.2	18.4
Anganwadi/ASHA/ ANM	0.7	2.0	0.3	2.7	0.4	2.6
DOT Centre	0.4	0.0	0.3	0.2	0.4	0.2

Government mobile clinic	0.5	1.7	2.1	4.2	1.5	3.7
ESI Hospital	1.8	1.0	0.7	2.0	1.1	1.7
Other public sector health facility	0.5	1.0	0.6	2.2	0.6	1.9
NGO or Trust Hospital/Clinic	0.6	0.0	1.6	0.0	1.2	0.0
Private hospital	15.7	14.7	22.6	7.7	20.2	9.3
Private doctor/clinic	1.4	0.0	1.4	2.1	1.4	1.6
Medical college	0.6	0.9	0.0	0.0	0.2	0.2
Pharmacy/Drug Store	0.0	3.8	0.4	4.0	0.2	4.0
Don't know/Can't say	28.0	24.7	27.9	26.9	27.9	26.5
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

Finally, we asked respondents about the cost and duration of treatment for TB. The results indicated that there was a slight increase in the proportion of respondents who said that no cost needed to be incurred for TB treatment between baseline and end-line surveys (see Table 18). In the baseline, 17% of the respondents said no money was needed for TB treatment, and this increased to 25% in the end-line survey. Surprisingly, nearly three-fifths of the adults were not aware about the cost of TB treatment. About 10% and 5% of the respondents in the baseline and end-line considered the cost of treatment to be ₹10000 or higher.

We did not notice much change between baseline and end-line surveys in the proportion of the respondents who reported six months as the duration for TB treatment. However, close to half of the adults did not know or could not say the duration of the treatment in the end-line survey. The results indicate that the knowledge about cost and duration of treatment did not improve as much as other knowledge aspects discussed previously.

**Table 18: Percentage distribution of adults by sex, according to the cost and duration of treatment for TB in the baseline and end-line surveys, Bengaluru**

Item	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
<b>Cost of treatment (in ₹)</b>						
No cost	18.8	27.3	15.3	24.7	16.5	25.2
1 – 9999	7.6	11.3	4.9	9.2	5.8	9.7
10000+	9.7	6	9.9	5	9.8	5.2
Don't know/Can't say	63.9	55.4	70.0	61.1	67.8	59.9
<b>Duration of treatment</b>						
<6 months	16.9	25.3	18.2	22.3	17.7	22.9
6 months	29.2	23.1	28.6	26.2	28.8	25.5
6+ months	12.0	4.5	11.1	5.9	11.4	5.6
Don't know/Can't say	41.9	47.0	42.1	45.6	42.0	46.0
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

We read out two statements, “TB is fully curable” and “All TB patients need admission in hospitals for treatment”, to the respondents and recorded their response on a five score Likert scale. We did not notice any change in the proportion of respondents who either strongly agreed or agreed to the statement that “TB is fully curable” between baseline and end-line surveys. There was no difference based on sex in response to this statement. However, the proportion of adults who could not answer this statement reduced from 38% in the baseline to 16% in the end-line. Regarding the statement that “All TB patients need admission in hospitals for treatment”, 71% in the baseline and 65% in the end-line either strongly agreed or agreed. The proportion of respondents who did not respond to this statement remained the same between baseline and end-line surveys.

**Table 19: Percentage distribution of adults by sex, according to their opinion on statements that “TB is fully curable” and “all TB patients need admission in hospital for treatment” in the baseline and end-line surveys, Bengaluru**

Statement	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
<b>TB is fully curable</b>						
Strongly agree	50.7	52.8	54.5	55.0	53.2	54.5
Agree	15.2	16.5	15.9	12.7	15.7	13.5
Neither agree nor disagree	4.5	7.2	2.3	8.7	3.1	8.4
Disagree	5.9	4.4	1.6	3.6	3.1	3.8
Strongly disagree	0.0	0.0	0.0	0.3	0.0	0.2
Don't know/Can't say	23.6	19.0	25.6	19.8	24.9	19.6
<b>All TB patients need admission in hospital for treatment</b>						
Strongly agree	50.9	46.0	56.4	44.9	54.5	45.1
Agree	18.5	21.3	14.9	19.5	16.2	19.9
Neither agree nor disagree	2.7	9.1	2.6	4.8	2.6	5.8
Disagree	2.9	3.4	0.9	5.2	1.6	4.8
Strongly disagree	0.0	0.0	0.3	0.3	0.2	0.2
Don't know/Can't say	25.0	20.3	24.9	25.4	24.9	24.2
<b>Number of cases</b>	<b>160</b>	<b>109</b>	<b>298</b>	<b>384</b>	<b>458</b>	<b>493</b>

We asked the respondents questions to understand their willingness towards disclosure of TB status to other people. The results are provided in Table 20. We do not present the responses which were given by less than 5% of the respondents. The most frequent response to the person to whom a TB patient should disclose his/her status remained the same during both baseline and end-line surveys. In both baseline and end-line surveys, the most frequently-reported were spouse (75% vs. 73%), doctor (51% vs. 67%), parents (49% vs. 62%) and children (27% vs. 30%). The increase in responses between baseline and end-line was greatest for doctors and parents. In both baseline and end-line surveys, a slightly greater proportion of females mentioned the spouse and parents. However, more males than females reported the doctor as the person to whom a TB patient should disclose their TB status.

**Table 20: Percentage distribution by sex of adults, according to whom a TB patient should disclose that he/she has TB (among those who knew or had heard about TB) in the baseline and end-line surveys, Bengaluru**

Person to whom TB status should be disclosed	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Doctor	57.6	75.3	47.8	64.8	51.2	67.1
Spouse	76.4	68.7	74.5	74.4	75.2	73.2
Children	30.0	25.3	25.8	30.7	27.2	29.6
Parents	41.2	55.7	52.8	63.8	48.8	62.0
Siblings	3.7	8.4	3.9	14.9	3.8	13.4
Friends	13.6	14.5	7.8	14.6	9.8	14.6
Neighbours	0.8	5.6	0.8	3.7	0.8	4.2
Nobody	0.0	2.9	0.5	0.5	0.3	1.0
Don't know/Can't say	1.6	0.0	1.6	2.4	1.6	1.8
<b>Number of cases</b>	<b>124</b>	<b>93</b>	<b>238</b>	<b>331</b>	<b>362</b>	<b>424</b>

We asked respondents who agreed that a TB patient should disclose his or her status for reasons why. In the end-line, the most-frequent responses were treatment support (73%), family support (62%), quick treatment (52%) and emotional support (40%). In the end-line, comparatively more females than males reported quick treatment and emotional support as the reasons for disclosure. However, in the baseline, the most-frequent responses were family support (48%), quick treatment (39%), treatment support (39%) and emotional support (28%). The results also indicated that comparatively more persons in the end-line gave these options as the reasons for non-disclosure, as compared to the baseline.

**Table 21: Percentage distribution of adults by sex, according to reasons for disclosing one's TB status (among those who said that a person should disclose his/her TB status) in the baseline and end-line surveys, Bengaluru**

Reason for disclosure	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Quick treatment	48.6	47.6	33.3	53.8	38.6	52.4
Prevent spread	22.6	35.1	17.4	35.2	19.2	35.2
Emotional support	21.7	35.6	30.8	41.1	27.7	39.9
Family support	47.0	60.9	48.0	62.5	47.7	62.2
Treatment support	36.2	75.2	40.7	72.7	39.2	73.3
Financial support	14.5	9.2	15.7	14.8	15.3	13.6
<b>Number of cases</b>	<b>122</b>	<b>90</b>	<b>233</b>	<b>322</b>	<b>355</b>	<b>412</b>

We also enquired from respondents about the person to whom one should not disclose one's TB status. The results are presented in Table 22. In both baseline and end-line surveys, the most frequent responses were neighbours (43% vs. 46%), other relatives (26% and 34%) and friends (22% vs. 22%). We noticed an increase in the proportion of respondents who mentioned other relatives between baseline and end-line surveys. In the end-line more females than males mentioned non-disclosure to neighbours and other relatives. We also noticed that a higher proportion of respondents in the end-line opted to not respond to the question on non-disclosure.

**Table 22: Percentage distribution of adults by sex, according to persons to whom one should not disclose one's TB status (among those who knew or had heard about TB) in the baseline and end-line surveys, Bengaluru**

Person to whom TB status should not be disclosed	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Spouse	7.7	3.4	2.5	0.3	4.3	1.0
Children	5.4	8.1	4.1	3.5	4.5	4.5
Aunt/ uncle	8.4	0.0	1.9	2.2	4.2	1.7
Other relatives	27.7	29.3	24.5	35.0	25.6	33.8
Friends	23.9	25.1	21.6	20.5	22.4	21.5
Schoolmates	9.8	6.3	9.5	4.3	9.6	4.8
Co-workers	12.1	9.6	9.4	6.6	10.3	7.3
Boss	18.1	3.9	12.8	3.4	14.6	3.5
Neighbours	38.8	32.8	44.9	49.6	42.8	45.9
Anybody	2.6	11.5	4.4	9.0	3.8	9.6
Other	1.9	9.3	1.7	3.7	1.7	4.9
Don't know/Can't say	10.6	23.8	12.9	21.0	12.1	21.6
<b>Number of cases</b>	<b>124</b>	<b>93</b>	<b>237</b>	<b>331</b>	<b>361</b>	<b>424</b>

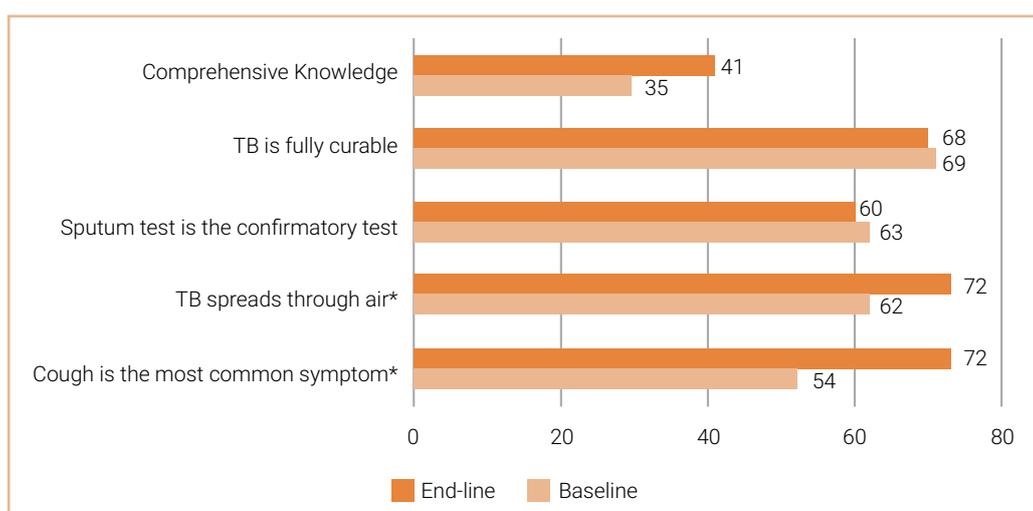
The reasons for non-disclosure were also examined and the results are shown in Table 23. In the end-line survey, the most-frequently reported reasons for non-disclosure of one's TB status were that people in the community will avoid the TB patient (81%), that the patient's family name will be spoiled (63%) and that people in the community will try to drive the patient out (26%). In the end-line survey, more females than males reported that the patient's family name will be spoiled and that people in the community will avoid the TB patient. However, in the baseline, the most frequent responses were that the patient's family name will be spoiled (58%), people in the community will avoid the TB patient (33%), and the community will try to drive the patient out (22%). The proportion of respondents reporting that the patient's family name will be spoiled and that people in the community will avoid the TB patient increased between baseline and end-line surveys.

**Table 23: Percentage distribution of adults by sex, according to reasons for non-disclosure of one's TB status (among those who reported that one should not disclose one's TB status) in the baseline and end-line surveys, Bengaluru**

Reasons for non-disclosure	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
The family name will be spoiled	64.9	51.5	54.4	66.2	58.1	63.0
People in the community will avoid him/her	33.4	72.5	32.2	83.7	32.6	81.3
People in the community will try to drive him/her out	20.6	36.4	22.5	23	21.8	25.8
Loss of job	17.6	6.3	6.5	7.6	10.4	7.3
Other	13.5	7.9	16.5	2.8	15.4	3.9
Don't know/Cannot say	2.9	4.6	2.7	2.1	2.8	2.7
<b>Number of cases</b>	<b>110</b>	<b>71</b>	<b>217</b>	<b>262</b>	<b>317</b>	<b>333</b>

We devised a composite index based on four key knowledge aspects of TB to indicate comprehensive knowledge of TB among adults. The components of the comprehensive knowledge included the fact that 1) TB spreads through air when a person with TB coughs or sneezes, 2) cough is the most common symptom of lung TB, 3) sputum test is the confirmatory test for TB and 4) that TB is fully curable. Figure 1 provides the distribution of the respondents according to comprehensive knowledge and its component indicators in the baseline and end-line. Among the component indicators, the change between baseline and end-line was highest for the respondents reporting that cough is the most common symptom of lung TB (18 percentage points), and followed by reporting that TB spreads through air (10 percentage points). We noticed a small decline in the proportion of respondents who knew that TB is curable and that the sputum test is the confirmatory test for TB, between baseline and end-line surveys. Consequently, the comprehensive knowledge level increased from 35% in baseline to 41% in the end-line survey, showing an increment of 6 percentage points.

**Figure 1: Percentage of adults with comprehensive knowledge and its components**



**Note: \* increase is statistically significant at <0.05**

We also examined the changes in comprehensive knowledge between baseline and end-line surveys among the respondents, according to different characteristics. Although we noticed an increase in comprehensive knowledge between the baseline and end-line, it was not statistically significant (see Table 24). For most of the socio-economic and demographic characteristics, although we identified an increase in comprehensive knowledge over the time period, it was not statistically significant. The increase in comprehensive knowledge was found to be statistically significant for adults aged less than 40 years and adults who are currently married. The increase was identified to be statistically significant at a p-value of below 10% level for males, persons who completed 1-7 years of school, Hindus, and persons engaged in employment other than government or private jobs.

**Table 24: Percentage distribution of respondents who had comprehensive knowledge on TB, according to selected characteristics, in the baseline and end-line surveys, Bengaluru**

Characteristic	Baseline		End-line		p-value
	Percent	Number of cases	Percent	Number of cases	
<b>Sex of the respondent</b>					
Male	30.9	160	41.3	109	0.081
Female	37.2	298	40.3	384	0.423
<b>Age (in years)</b>					
< 40	36.5	283	44.8	310	0.040
40-59	33.3	140	38.0	145	0.411
60+	30.1	35	14.6	38	0.119
<b>Marital status</b>					
Currently married	34.1	336	42.3	384	0.024
Marriage dissolved	36.0	61	30.7	67	0.525
Never married	39.2	61	39.5	42	0.974
<b>Literacy and education</b>					
Illiterate	18.2	110	25.8	148	0.152
Literate, 1-7 years of schooling	31.6	105	43.8	102	0.071
8+ years of schooling	44.1	243	48.0	243	0.391
<b>Occupation</b>					
Business	26.1	45	36.5	32	0.334
Salaried job	55.5	45	57.9	35	0.832
Other job	29.7	158	38.9	209	0.069
Not working	36.6	114	39.8	217	0.494
<b>Religion</b>					
Hinduism	34.1	347	40.7	360	0.071
Islam	33.1	79	34.6	82	0.837
Other	49.9	32	48.4	52	0.895

Caste/Tribe					
Scheduled Caste/Tribe	33.9	211	38.8	292	0.263
Others	36.0	247	42.9	201	0.135
Personal monthly income (in ₹)					
< 5000	34.2	266	42.0	264	0.923
5000+	36.1	192	38.7	229	0.585
Household monthly income (in ₹)					
< 15000	32.3	273	36.7	193	0.253
15000+	39.0	185	42.9	300	0.401
<b>Total</b>	<b>35.0</b>	<b>458</b>	<b>40.5</b>	<b>493</b>	<b>0.084</b>

**Note: Comprehensive knowledge includes the facts that that cough is the most common symptom of lung TB, TB spreads through air, sputum test is the confirmatory test for TB, and TB is curable.**

## Exposure to THALI program

We enquired from all the adults about their exposure to various community engagement activities conducted under THALI. These activities include exposure to various IEC materials as well as communication activities to impart information on various key aspects of prevention, control and treatment carried out at the community level. During the end-line survey, all the respondents were shown selected IEC materials which were used extensively by the CHW or displayed in public places, and they were asked whether they had seen those materials. Table 25 provides the distribution of the respondents who had seen specific IEC materials. We noticed that about 73% of the respondents had seen at least one of the IEC materials. However, when we examined the specific type of IEC material seen by the respondent, it was observed that most frequently reported IEC material was the cough hygiene leaflet or poster (59%), followed by the community handout leaflet (53%), pourakarmika poster (34%), and school brochure (27%). A slightly greater proportion of males were reported to have seen many of these IEC materials.

**Table 25: Percentage distribution by sex of adult CS persons according to what they did during the first two weeks and after two weeks of cough in the baseline and end-line surveys, Bengaluru**

Type of IEC material	Male	Female	Total
Cough hygiene leaflet/poster	58.2	59.6	59.3
Community handout	58.8	50.9	52.6
School brochure	33.7	25.5	27.3
Construction worker poster	32.6	24.2	26.0
Auto driver poster	34.5	20.8	23.8
Pourakarmika poster	43.2	31.4	34.0
Young girl poster	20.5	15.7	16.8
Exposure to any of the above IEC materials	75.6	71.8	72.7
<b>Number of cases</b>	<b>109</b>	<b>384</b>	<b>493</b>

We asked adults who had seen the IEC materials about the place where or the person with whom they had seen those materials. We noticed that nearly four-fifths of the respondents mentioned that the public hospital was the place where they had seen the IEC material. Anganwadi centre (24%) and petty shop/tea shop (20%) were the other most frequent responses. Around 13% of the respondents reported that they had seen the materials with the KHPT/THALI CHW. More females (81%) than males (75%) reported that they had seen the IEC materials in the public hospital.

**Table 26: Percentage distribution of adults by sex, according to the place where or the person with whom they had seen the IEC materials (among the persons who had seen the IEC materials), Bengaluru**

Place where/person with whom the IEC material was seen	Male	Female	Total
KHPT/THALI CHW	15.7	12.6	13.3
Public hospital	75.1	80.9	79.6
Anganwadi centre	25.5	22.9	23.5
Petty shop/tea shop	18.9	20.2	19.9
Self-help Group	6.8	2.6	3.5
Slum association	3.5	2.5	2.8
Youth group	3.5	0.9	1.5
Labour unions	8.0	3.8	4.8
Faith-based organisation	0.0	0.4	0.3
Community Based Organisations	2.2	5.7	4.9
During public campaigns	3.4	3.2	3.3
Others	20.3	14.6	16.0
Don't know	8.3	7.0	7.3
<b>Number of cases</b>	<b>82</b>	<b>276</b>	<b>358</b>

We enquired about what messages the respondents received from the IEC materials. Nearly half of the respondents who had seen the IEC materials mentioned that covering one's mouth while coughing was a way to prevent the spread of TB. Other frequently-reported responses on information received from the IEC materials were the common symptoms of TB (35%) and that TB patients should eat nutritious food (13%). More males than females reported that covering one's mouth while coughing was a way to prevent the spread of TB (56% vs. 49%) and mentioned TB's common symptoms (39% vs. 34%) as the information received from the IEC materials. However, it was surprising to note that 30% of the respondents were not able to state what information they had understood from the IEC materials.

**Table 27 Percentage distribution of adults by sex, according to the information received from the IEC materials (among persons who had seen the IEC materials), Bengaluru**

Information received from IEC materials	Male	Female	Total
Covering one's mouth while coughing prevents the spread of TB	56.3	49.0	50.7
Eat nutritious food	6.5	14.8	12.9
Common symptoms of TB	38.6	33.7	34.8
Test sputum for TB	11.1	9.8	10.1
TB can be completely cured	12.1	7.6	8.6
Adherence to TB medication is important	2.4	2.7	2.6
Consequences of not treating TB	2.4	1.8	1.9
Risk of alcohol consumption and TB	4.5	3.4	3.7
Risk of tobacco consumption and TB	5.7	3.9	4.3
Stop alcohol consumption during treatment	1.2	1.5	1.5
Complete the full course of treatment	1.1	1.9	1.7
Test for TB, if one has a persistent cough for more than 2 weeks	3.8	3.6	3.7
Others (specify)	5.7	4.3	4.6
Don't know/can't say	26.7	30.5	29.6
<b>Number of cases</b>	<b>141</b>	<b>188</b>	<b>329</b>

In addition to these IEC materials, the CHWs had also conducted other community engagement activities such as in-person contact meetings, sensitization meetings for key opinion leaders (KOLs), and small or large group TB meetings. We collected information about the exposure to these activities from all the respondents and the results are provided in Table 28. We specifically analyzed the exposure of the respondents to in-person contact, participation in sensitization meetings and participation in small or large group meetings on TB. Overall, 58% of the respondents were contacted in-person, a little more than one-third had attended the small or large group meetings on TB, and only 17% percent of the respondents had attended the sensitization meetings. Comparatively more females (60%) than males (48%) were exposed to in-person contact. However, a slightly higher proportion of males were exposed to sensitization meetings and small or large meetings.

**Table 28: Percentage distribution of adults by sex who were exposed to various community engagement activities in the end-line survey, Bengaluru**

Exposed to	Male	Female	Total
<b>In-person contact</b>			
Yes	48.2	60.4	57.7
No	51.8	39.6	42.3
<b>Sensitization meeting</b>			
Yes	20.4	15.7	16.7
No	79.6	84.3	83.3
<b>Small or large group meeting on TB</b>			
Yes	41.1	37.7	38.5
No	58.9	62.3	61.5
<b>Number of cases</b>	<b>109</b>	<b>384</b>	<b>493</b>

# 05

## PROGRAM IMPLICATIONS AND RECOMMENDATIONS



## Effect of THALI program exposure on knowledge of TB

We noticed an increase in the knowledge aspects of TB among the adults living in the urban slum areas of Bengaluru. However, we were not able to attribute with any certainty that the change in these aspects was due to the introduction of the program. In reality, the causal effect of any intervention program for individual “i” is the comparison of individual “i’s” outcome if individual “i” is exposed to the intervention (i.e. the potential outcome in the presence of intervention), and individual “i’s” outcome if individual “i” is not exposed to the intervention (the potential outcome in the absence of intervention). The major problem of causal inference of the intervention program is that, for each individual, we can observe only one of these potential outcomes, because each unit (each individual at a particular point in time) will receive either treatment or control, not both. However, due to the availability of advanced statistical techniques, one is able to identify the effect of the program using non-experimental data. Matching methods are techniques that attempt to replicate, as closely as possible, the ideal of randomized experiments when using observational data (non-experimental data) and provide a way to estimate the causal effect of the intervention program. The goal of matching is, for every exposed unit, to find one (or more) non-exposed unit(s) with similar observable characteristics against whom the effect of the intervention can be assessed. By matching exposed units to similar non-exposed units, matching enables a comparison of outcomes among exposed and non-exposed units to estimate the effect of the intervention reducing bias due to confounding. We used the Euclidean distance metric to match the exposed and non-exposed individuals through nearest neighborhood matching and used the characteristics such as sex of the person, age of the person and religion of the respondent to match each observation. Since the sample may not be sufficient to identify the impact of the program using the data from Bengaluru alone, we pooled the data of Bengaluru with a similar study conducted in Hyderabad. We used characteristics such as age, sex, name of the city, occupation, education, religion, marital status, caste/tribe, and household income of the respondents as the covariates in the model.

The pooled data contains the information for 921 respondents from Bengaluru and Hyderabad. We first examined the percentage of respondents according to their exposure to various THALI community engagement activities. Specifically, we examined the exposure to any of the IEC materials shown to them, in-person contacts, sensitization meetings and small or large meetings from the pooled data (see Table 29). Overall, according to the pooled data, 77% of the respondents were exposed to any one of the IEC materials shown to them, 66% were exposed to in-person contact, 18% had participated in a sensitization meeting and 39% had attended a small or large meeting on TB. According to the pooled data, comparatively more males than females were exposed to various community-level activities.

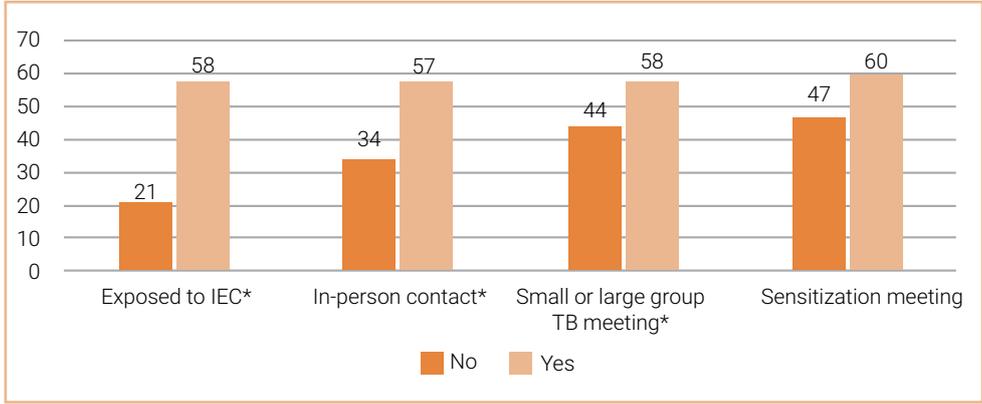
**Table 29: Percentage distribution of adults according to the exposure to THALI community activities in the end-line survey, using the pooled data from Bengaluru and Hyderabad**

Exposed to	Male	Female	Total
<b>Any IEC material</b>			
Yes	82.0	75.0	77.1
No	18.0	25.0	22.9
<b>In-person contact</b>			
Yes	69.6	63.7	65.5
No	30.4	36.3	34.5
<b>Sensitization meeting</b>			
Yes	22.7	16.3	18.2
No	77.3	83.7	81.8

Small or large group meeting on TB			
Yes	45.6	35.6	38.6
No	54.4	64.4	61.4
<b>Number of cases</b>	<b>281</b>	<b>640</b>	<b>921</b>

We analyzed the difference in comprehensive knowledge by respondents' exposure to various community activities based on the pooled data (see Figure 2). The results indicate that the exposed group had a higher level of comprehensive knowledge than the non-exposed group. The analysis showed that 58% of the respondents who were exposed to the IEC materials had comprehensive knowledge as compared to 21% of the non-exposed group, 57% of the respondents who had in-person contact with the CHW had comprehensive knowledge as compared to 34% persons not contacted, and 58% of respondents who attended small or large meetings on TB had comprehensive knowledge, as compared to 44% of persons that did not attend. 60% of the respondents who attended the sensitization meetings had comprehensive knowledge on TB, as compared to 47% who did not attend.

**Figure 2: Percentage of adults who had comprehensive knowledge on TB according to exposure to specific community activity**



**Note: \* increase is statistically significant at <0.05**

The results of the analysis of the effect of the specific exposure on the outcome variable, namely comprehensive knowledge on TB, using the pooled data from Bengaluru and Hyderabad are presented in Table 30. The final model included only the variables that had achieved balancing properties based on the kernel density and box plots. All the three specific exposure indicators such as having seen IEC material, had in-person contact and having participated in small or large group TB meetings showed significant effect on the comprehensive knowledge of TB. The results indicate that the exposure to IEC materials should have increased significantly comprehensive knowledge by 35 percentage points as compared to the non-exposed groups, and this exposure produced the maximum increment. Other exposure indicators such as small or large group TB meetings should have increased comprehensive knowledge by 12 percentage points, and in-person contact should have increased comprehensive knowledge by 21 percentage points when compared to the non-exposed group.

**Table 30: Average effect of exposure on in-person contact, IEC materials and small or large group TB meetings on comprehensive knowledge, pooled data for Bengaluru and Hyderabad**

Average exposure effect of	Coefficient	SE	p - value	[95% CI]	
				Lower	Upper
<b>Comprehensive knowledge</b>					
In-person contact	0.21	0.041	<0.001	0.13	0.29
Exposure to IEC materials	0.35	0.043	<0.001	0.26	0.43
Small or large group TB meetings	0.12	0.038	0.001	0.05	0.20

**Covariates used: sex, age, education, religion, caste/tribe, marital status, occupation, household monthly income and district name**

**For exposure to IEC materials, education, religion, occupation and marital status, and for small or large group TB meetings education and caste/tribe were not used as covariates since balancing property was not achieved for these variables.**

**We used sex of the respondent, age of the respondent and district name as matching variables.**

## Limitations of the study

We used retrospective data collection to estimate the changes in the knowledge about TB. Owing to this, there could be recall bias in providing information on the various key knowledge components enquired about in the survey. There could also be a recall bias in respondents' information about their exposure to the THALI program. Since we had shown the selected IEC materials to the respondents and asked about their exposure, there is less likelihood that this aspect is underestimated. However, information on other aspects of the exposure to THALI program had to be recalled and those are likely to be underestimated. The matching method used in the report relies on observed characteristics to construct a comparison group, and so it requires the strong assumption of no unobserved differences in the exposed and non-exposed groups that are also associated with the outcomes of interest. We used only three important characteristics to identify the matched comparison group, so we might have left out other potentially important characteristics.

## Key changes noticed

We noticed that the proportion of respondents who had comprehensive knowledge on TB increased between baseline and end-line surveys, but this was not significant because there was not much change in the proportion of respondents who said sputum test is the confirmatory test and TB is fully curable. The respondents' knowledge on key aspects including the fact that TB spreads through air and cough is the most common symptom of TB significantly increased during the period between baseline and end-line surveys. However, we noticed an increase in the proportion of respondents who reported that wearing a mask and prompt diagnosis and treatment are ways to prevent the spread of TB within the family or community. In the end-line, there was an increase in the proportion of respondents who reported that they were not aware of the duration of the treatment. We noticed a slight increase in the proportion of respondents who reported that one should not disclose their TB status to other relatives, particularly among females. We noticed a slight increase in the proportion of persons who said that TB treatment was available for free, but a majority of them didn't know of this. Stigma around disclosure of TB does not appear to have been diminished, with a large majority of them citing reasons suggestive of discrimination, if they disclose their TB status to neighbours, friends and others.

## Program implications and recommendations

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The findings from the study can be used for future implementation of programs related to TB. We identified a little more than a quarter of the respondents to be illiterate. Any IEC activities for disseminating knowledge and health seeking behavior for TB should include both visual and verbal media. We also noticed that although 73% of the adults were exposed to the IEC materials developed by the THALI program, about 30% of them could not explain the information that they had received through these IEC materials. Exposure to the IEC materials improved the comprehensive knowledge on TB and thus, the other key aspects of TB. It must be noted that the IEC materials were developed and supplied to the field at a very late stage of program implementation. Due to the parliamentary elections in Karnataka, some of the posters developed and displayed in the public places had to be removed as the code of conduct was in force in the state. Similarly, the IEC materials were also supposed to be used by the CHWs whenever they were making in-person contacts. The respondents rarely reported that they had seen IEC materials with the CHW. For example, 58% of the respondents were reported to have exposed to in-person contacts, but only 13% of the adults reported that the CHW was the source of information on the IEC materials. In addition to the exposure to the IEC materials, other community activities such as in-person contacts and small or large group meetings were also found to improve the comprehensive knowledge on TB among the adults, but the extent of difference between the exposed versus the non-exposed groups was comparatively smaller as compared to exposure to IEC materials.

Government health facilities were not used by more than half of the households of the adults due to issues of accessibility and perceived quality of care. There is scope to support government health facilities in improving systems and quality standards, to enhance knowledge of the community on government services, and ensure that facilities provide TB diagnostic and treatment services for free. This will in turn improve health seeking at government health facilities. Close to 60% of the households in the slum areas preferred to consult a private health facility. Government FLWs did not serve as a prominent source of information on TB. It is essential to strengthen the information source and referral mechanism at the grass root level to make government health facilities more accessible to the urban slum populations in Bengaluru.

## Conclusions

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The study highlights that THALI's community engagement activity was perhaps able to improve the comprehensive knowledge on TB by exposure to various activities, particularly the use of IEC materials. The diffusion of the messages that TB is fully curable and sputum test is the confirmatory test were not remarkable, and as such we did not find significant improvement in the comprehensive knowledge between the baseline and end-line surveys. The reasons for this are multiple. THALI - CHWs were more focused on identifying individuals with TB symptoms and providing care and support to confirmed TB patients, than on disseminating TB information to the general population. The late production and distribution of IEC materials and poor understanding of the messages is reflected in the fact that most of the respondents saw the materials in public health facilities, so might not have grasped the messages clearly. Therefore, there was a considerable proportion of respondents who were not able to explain what specific message they had learned, even though they had seen the IEC materials. TB-related stigma remained high, as is evident from the non-willingness for disclosure and perceived and real notions of discrimination if one's TB status is disclosed. Community engagement activities need to develop, implement and evaluate innovative approaches to reduce TB stigma and discrimination.

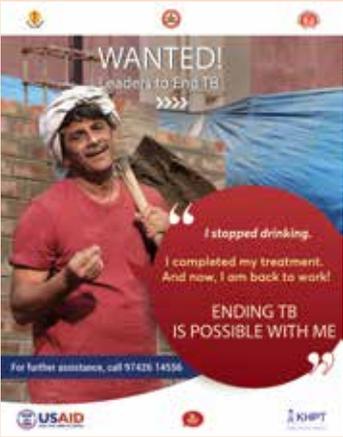
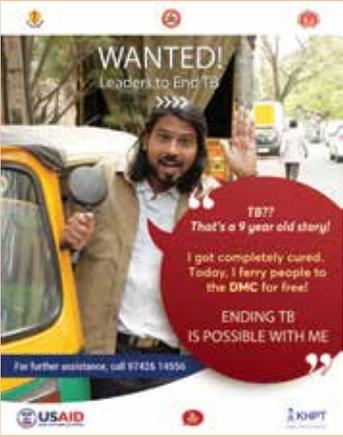
06

ANNEXURE

# ANNEXURE

## Communication materials used to understand respondents' exposure to the THALI program

Material	Communication Objectives	IEC Material
<p><b>Cough Hygiene Leaflet/Poster</b></p>	<p>Maintaining cough hygiene through simple methods is essential to prevent the spread of infection</p>	 <p><b>Cough Etiquette</b> How to prevent germs from spreading through coughing or sneezing?</p> <ol style="list-style-type: none"> <li>Cover your mouth and nose with cloth or paper</li> <li>Use your upper sleeve or elbow if there is no handkerchief. Do not use your hand</li> <li>If you cough frequently, use a mask</li> <li>Wash hands often. It is good to use soap</li> </ol>
<p><b>Community Handout (4 pages)</b></p>	<p>Provides basic information on TB, symptoms, testing, treatment and healthy habits</p>	 <p><b>About TB</b></p> <ul style="list-style-type: none"> <li>TB is an infectious disease caused by a bacteria.</li> <li>TB spreads from one person to another mainly through the air while coughing.</li> <li>TB can be cured the right drugs of the right dosage for the right duration.</li> </ul> <p><b>Common Symptoms of TB</b></p> <ul style="list-style-type: none"> <li>Persistent cough for more than two weeks is the most common symptom of TB.</li> </ul>
<p><b>School Brochure (2 pages)</b></p>	<p>Basic information on TB through a question and answer format</p>	 <p><b>“ಕುಗ್ಗು ಕೂಗುತ್ತಿರುವವರನ್ನು ದೂರವಿಡಿಯಿರಿ”</b> “ಕುಗ್ಗು ಕೂಗುತ್ತಿರುವವರನ್ನು ದೂರವಿಡಿಯಿರಿ.”</p> <p><b>ಕುಗ್ಗು ಕೂಗುತ್ತಿರುವವರನ್ನು ದೂರವಿಡಿಯಿರಿ</b></p> <p><b>ಕುಗ್ಗು ಕೂಗುತ್ತಿರುವವರನ್ನು ದೂರವಿಡಿಯಿರಿ</b></p>

<p><b>Construction Worker-poster</b></p>	<p>Taking individual and collective responsibility for Ending TB</p>	 <p>The poster features a construction worker in a red shirt and white turban. Text includes: 'WANTED! Leaders to End TB', 'I stopped drinking. I completed my treatment. And now, I am back to work!', 'ENDING TB IS POSSIBLE WITH ME', and 'For further assistance, call 97426 14556'. Logos for USAID and KHP are at the bottom.</p>
<p><b>Auto Driver-Poster</b></p>	<p>Taking individual and collective responsibility for Ending TB</p>	 <p>The poster features an auto driver in a white shirt and brown jacket. Text includes: 'WANTED! Leaders to End TB', 'TB? That's a 9 year old story! I got completely cured. Today, I ferry people to the DMC for free!', 'ENDING TB IS POSSIBLE WITH ME', and 'For further assistance, call 97426 14556'. Logos for USAID and KHP are at the bottom.</p>
<p><b>Pourakarmika - Poster</b></p>	<p>Taking individual and collective responsibility for Ending TB</p>	 <p>The poster features a woman in a brown sari. Text includes: 'WANTED! Leaders to End TB', 'I sweep the streets of the city. We can sweep away TB too!', 'Persistent cough for 2 weeks? Go for a Sputum Test!', 'ENDING TB IS POSSIBLE WITH US', and 'For further assistance, call 97426 14556'. Logos for USAID and KHP are at the bottom.</p>
<p><b>Young Girl- Poster</b></p>	<p>Taking individual and collective responsibility for Ending TB</p>	 <p>The poster features a young girl in a white shawl. Text includes: 'WANTED! Leaders to End TB', 'It was terrible to hear my father coughing all night. I took him to a DMC, where he was tested and treated.', 'ENDING TB IS POSSIBLE WITH ME', and 'For further assistance, call 97426 14556'. Logos for USAID and KHP are at the bottom.</p>

*Local language versions of these materials were used during the survey*







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