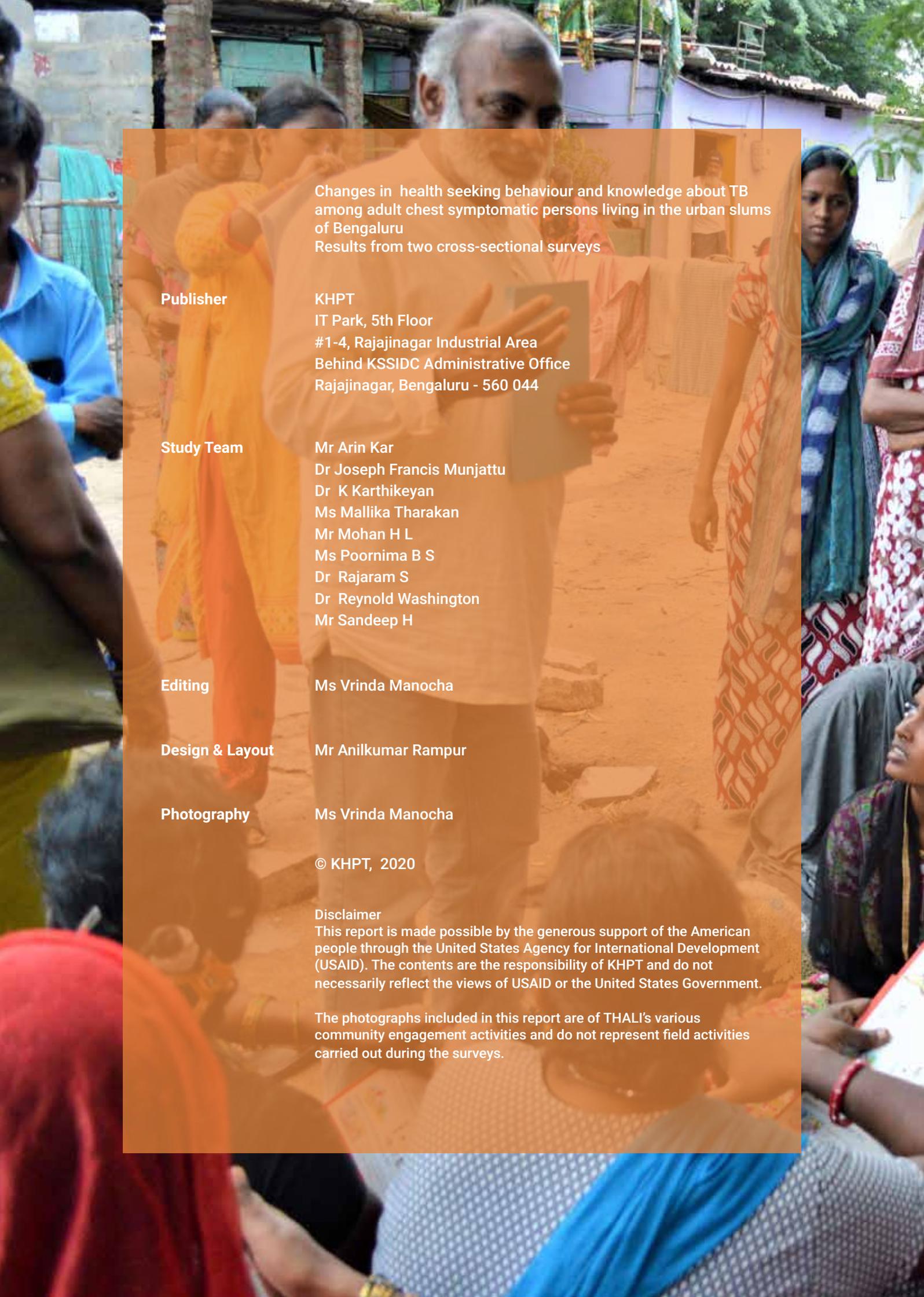




Changes in health seeking behaviour and knowledge about TB among adult chest symptomatic persons living in the urban slums of Bengaluru

Results from two cross-sectional surveys



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Publisher

KHPT
IT Park, 5th Floor
#1-4, Rajajinagar Industrial Area
Behind KSSIDC Administrative Office
Rajajinagar, Bengaluru - 560 044

Study Team

Mr Arin Kar
Dr Joseph Francis Munjattu
Dr K Karthikeyan
Ms Mallika Tharakan
Mr Mohan H L
Ms Poornima B S
Dr Rajaram S
Dr Reynold Washington
Mr Sandeep H

Editing

Ms Vrinda Manocha

Design & Layout

Mr Anilkumar Rampur

Photography

Ms Vrinda Manocha

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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.



Changes in health seeking behaviour and knowledge about TB among adult chest symptomatic persons living in the urban slums of Bengaluru

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ACRONYMS

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

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

FOREWORD



GOVERNMENT OF KARNATAKA
OFFICE OF THE JOINT DIRECTOR (TB), LADY WILLINGDON STATE TB CENTRE,
4TH MAIN ROAD, SAMPANGI RAMANAGAR, BANGALORE-560 027.
E-mail: STOKA@rntcp.org, ☎ : 080 - 22249364; Fax - 080 - 22249361

LWSTC/RNTCP/PPM/02/2020-21

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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.


Dr. Ramesh Chandira Reddy
Joint Director, State TB Division
Bengaluru, Karnataka

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The baseline and end-line study on “Knowledge and Health Seeking Behaviour for TB among Adults Living in 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 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

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 Program (NTEP) and focused on behaviour 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

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

mapping 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 behaviour 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.

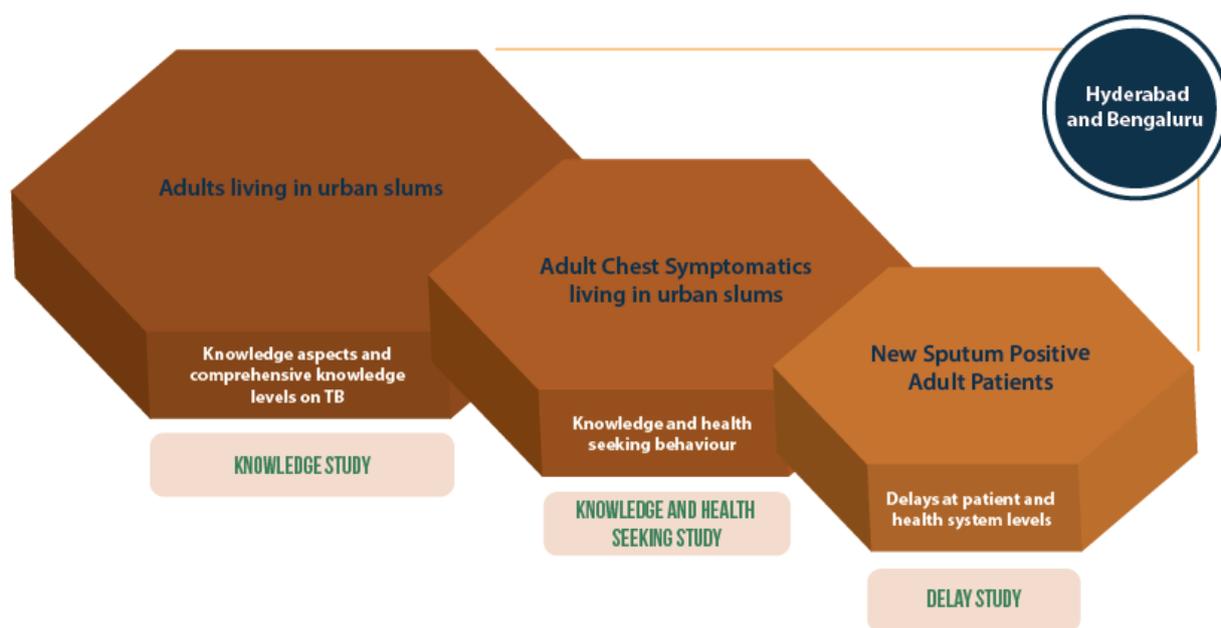
During the September 2016 - June 2019 period, the CHWs in Bengaluru referred 17,914 symptomatic persons for diagnostic tests, out of which 13,819 persons underwent tests. Among the tested persons, 1234 persons were found to have TB and 1204 persons were started on TB treatment.

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-tuberculosis treatment (ATT) in these two cities, as given in the diagram. 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 chest symptomatic persons living in urban slums in the Bengaluru Urban district.

Objective of the study

The aim of the study was to assess the health seeking behaviors among TB symptomatic persons living in the urban slums in relation to two key behaviours: a) seeking treatment from a healthcare provider in the two weeks after the onset of the cough and b) respondents themselves requesting a sputum test. We examined the changes in the mentioned health seeking behaviors between baseline and end-line surveys in the urban slum areas. In addition, we also studied the extent which the respondents were exposed to THALI program and the effect of the program exposure on the key outcome variables as discussed above. We also studied the level of key knowledge aspects of TB and the changes identified in these key knowledge aspects of TB between baseline and end-line.

Study Design

The study was conducted in selected slum areas in Bengaluru Urban district. The sample frame consisted of the slum mapping data collected through the CHWs. The initial and final updated slum mapping data was used 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 for 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 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 adult CS persons within each of the selected slum areas. We conducted a household listing operation, which included screening of household members who had cough, of more than two weeks duration in the last six months prior to the survey or were at the time having persistent cough in each of the selected urban slum areas to provide the necessary frame for selecting the adult CS persons that were to be interviewed for the study. 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 CS persons with an average of 8 adult CS 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 CS persons seeking care from a qualified healthcare provider over the project period from an assumed value of 50% with 95% confidence and 80% power, with a design effect of 1.5. Only one identified CS adult individual per household was selected for the interview. If in any urban slum area, the identified number of adult CS persons were less or equal to 8, then all of them were interviewed. If the number of selected CS adult persons were less than 8 in any selected urban slum area, then an additional CS person was recruited from another urban slum area where we had identified more than 8 CS persons. In slum areas with more than 8 CS adult persons, we categorized the CS persons by gender and systematically selected the required number of CS persons. The field team interviewed the selected CS adults in the local language or any language that was spoken by the respondent.

Data collection

We 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 persistent cough for more than two weeks, selection of segments and CS persons, 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 are conducted in private places, where the study participant feels comfortable. We gave them clear instructions to not 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 the response of the respondents. Before collecting the information, all the respondents provided informed written consent.

We designed a semi-structured questionnaire to collect information on background characteristics, health seeking behaviours after the start of the symptoms and the knowledge aspects regarding the 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 baseline survey, since we did not achieve the required sample size of CS persons from the 60 selected urban slum areas, we selected 20 additional urban slums in order to achieve the target sample size.

KHPT's dedicated team of field investigators collected the baseline data. However, Karvy Insights, a private organization with experience in data collection on a large scale, 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

Household listing and screening activities resulted in the identification of 462 and 568 adult CS persons in the baseline and end-line surveys, respectively (See Table 1). We selected 457 and 490 adult CS persons for interview in the baseline and end-line surveys. Out of the CS persons selected, interviews were completed for about 90% (413) and 94% (458) in the baseline and end-line surveys. Four percent of the selected CS persons in the baseline and 3% in the end-line refused an interview.

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

Status of survey	Baseline		End-line	
	Number of cases	Percent	Number of cases	Percent
Chest symptomatics identified	462		568	
Selected for interview	457	100.0	490	100.0
Completed	413	90.4	458	93.5
Refused	20	4.4	15	3.1
Not available	24	5.3	17	3.5

03

PROFILE OF THE SURVEY RESPONDENTS



Profile of the survey respondents

In both baseline and end-line surveys, we asked 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. There was some change in the distribution of sex among the respondents interviewed between baseline and end-line surveys. Male respondents were comparatively more in the baseline (49%) when compared to the end-line (41%). Comparatively more respondents were engaged in business-related work in the end-line (14%) than in the baseline survey (6%), and consequently the proportion of respondents not working reduced between the baseline (47%) and end-line (40%) surveys. There was a slight increase in the reported personal monthly income and household monthly income between baseline and end-line surveys; the household average monthly income in the baseline was ₹13120 and it increased to ₹16695 in the end-line survey.

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

Characteristics	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Sex						
Male					48.7	41.2
Female					51.3	58.8
Age						
< 40	31.1	30.7	41.9	46.6	36.6	40.0
40-59	34.6	37.4	37.4	36.2	36.0	36.7
60+	34.3	31.9	20.7	17.2	27.3	23.3
Mean age	49.3	49.8	43.9	42.9	46.5	45.8
Marital status						
Currently married	79.6	77.4	55.7	61.4	67.3	68.0
Marriage dissolved	9.4	9.4	35.7	34.2	22.8	23.9
Never married	11.1	13.2	8.7	4.4	9.9	8.1
Literacy and education						
Illiterate	35.0	37.0	44.9	46.2	40.1	42.4
Literate, 1-7 years of schooling	35.4	27.1	21.7	21.9	28.4	24.1
8+ years schooling completed	29.6	35.9	33.4	31.8	31.6	33.5
Occupation						
Business	8.9	18.8	3.4	10.4	6.1	13.9
Salaried job	5.1	10.0	2.8	4.5	3.9	6.8

Other job	50.7	51.2	36.4	30.8	43.4	39.2
Not working	35.2	42.7	57.3	54.3	46.6	40.2
Religion						
Hinduism	79.6	81.6	67.6	77.3	73.4	79.1
Islam	13.9	11.1	24.7	12.4	19.5	11.8
Other	6.5	7.3	7.7	10.3	7.1	9.1
Caste/Tribe						
Scheduled Caste	46.4	43.8	41.5	47.2	43.9	45.8
Scheduled Tribe	5.8	12.7	3.3	10.7	4.5	11.5
Others	47.8	43.5	55.2	42.1	51.6	42.7
Personal monthly income (in ₹)						
No income	30.4	23.8	55.8	51.8	43.4	40.2
<5000	7.5	7.7	19.8	9.3	13.8	8.6
5000+	56.5	64.6	22.3	34.6	38.9	47.0
Not mentioned	5.6	4	2.1	4.4	3.8	4.2
Mean income	6380.2	9157.1	2469.2	3973.0	4338.9	6116.1
Household monthly income (in ₹)						
< 5000	8.1	2.9	12.2	3.7	10.2	3.4
5000-14999	44.3	29.4	49.6	32.4	47.0	31.2
15000+	40.9	53.6	31.8	53.8	36.3	53.7
Not mentioned	6.6	14.1	6.3	10.0	6.5	11.7
Mean household income	14369.1	17652.3	11943.5	16049.9	13123.1	16693.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of cases	201	189	212	269	413	458

Household amenities

We collected information on the amenities available in the households. The results are presented in Table 3. We noticed 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 live in a house with three or more rooms (71% vs. 15%), live in house with more than one room for sleeping (70% vs. 17%), have a BPL card (73% vs. 61%), and live in a house having ventilation (65% vs. 21%). However, a slightly smaller proportion of respondents in the end-line reported that they have mobile phones (90%) as compared to baseline (94%).

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

Characteristic	Baseline	End-line
Type of house		
Kaccha	8.3	0.6
Semi-pucca	46.1	48.5
Pucca	45.6	50.8
Number of rooms		
1	37.9	8.0
2	47.5	21.4
3	11.2	53.7
4+	3.4	16.9
Number of rooms used for sleeping		
1	82.6	30.3
2	16.0	56.8
3	0.9	12.2
4+	0.5	0.7
Have BPL card		
Yes	61.2	73.2
No	38.8	26.6
House has window that can be opened		
Yes	49.5	75.5
No	50.5	24.5
Has ventilation facility		
Yes	21.2	65.1
No	78.8	34.9
Ownership of present house		
Own house	62.9	66.7
Not own house	37.1	33.3
Own a radio		
Yes	2.5	6.7
No	97.5	93.3

Own a telephone		
Yes	1	1.0
No	99	99.0
Own a mobile		
Yes	93.9	89.6
No	6.1	10.4
Own a television		
Yes	86.6	92.9
No	13.4	7.1
Total	100	100.0
Number of cases	413	458

Source of information on health

We enquired about the source of information on health-related issues among the respondents. We noticed an increase in the proportion of respondents reporting that they generally get health-related information from the government health workers between baseline (19%) and end-line (43%) surveys, particularly among females (15% vs. 44%). The most-frequently reported source of information on health in the baseline was television/radio (45%), followed by friends/relatives (21%), government health workers (19%) and newspapers and magazines (15%). In the end-line, though the topmost sources remained the same, the ranking of the sources slightly changed, with television/radio (50%) holding the topmost position followed by government health worker (43%), friends/relatives (27%) and newspaper and magazines (19%).

Table 4: Percentage distribution of adult CS persons by sex, according 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
Radio/TV	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
Number of cases	201	189	212	269	413	458

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, 47% of the respondents in the baseline said that the members of the household usually go to a public health facility for treatment. This was reduced to 36% in the end-line survey. On the other hand, household members usually accessing a private facility remains high and more respondents in the end-line reported they had accessed a private facility (61%) than in the baseline (52%).

Table 5: Percentage distribution of adult CS persons 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	50.7	34.2	39.6	27.7	45.0	30.3
Government dispensary	1.0	3.7	3.3	3.0	1.7	3.3
Other public sector health facility	0.5	3.7	0.0	2.2	0.2	2.8
NGO/Trust hospital/clinic	0.5	0.0	0.5	0.7	0.5	0.4
Private hospital	39.3	8.6	45.3	10.3	42.4	9.6
Private doctor/clinic	7.5	43.3	12.3	49.4	9.9	46.9
Home treatment	0.0	2.1	0.0	1.8	0.0	2.0
Other private sector health facility	0.5	4.3	0.0	4.9	0.2	4.6
Total percent	100	100.0	100	100.0	100	100.0
Number of cases	201	189	212	269	413	458

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 the reasons for not doing so. In the end-line survey, the most frequently reported reasons were the long distance to the facility (48%), inconvenient facility timings (32%), poor quality of care (27%), and long waiting times (24%) (see Table 6)

Table 6: Percentage distribution of adult CS persons by sex, according to the reasons for not getting treatment from a public 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	61.5	46.8	45.5	48.9	52.5	48.1
Facility timing not convenient	15.6	27.5	16.3	34.6	16.0	32.0
Health personnel often absent	8.3	11.0	11.4	13.2	10.0	12.4
Waiting time too long	28.1	22.9	24.4	24.7	26.0	24.1
Poor quality of care	22.9	26.6	35.0	26.9	29.7	26.8
No reason	3.1	11.9	2.4	11.0	2.7	11.3
Other	2.1	4.6	9.8	4.9	6.4	4.8
Number of cases	93	110	118	183	211	293

Availability of health insurance

We asked about the details of the health insurance scheme cover for the respondent or the other members of the family. We noticed that health insurance coverage increased between baseline and end-line surveys (see Table 7). For instance, in the baseline, only 17% of the adult CS persons reported that they had a health insurance scheme. This increased to 79% in the end-line. The increase cut across gender and was mostly due to the increased coverage of the state insurance scheme, the Ayushman Bharat-Arogya Karnataka, in the end-line survey. A greater number of respondents reported that they had more than one insurance scheme during the end-line (from 1% to 15%).

Table 7: Percentage distribution of adult CS persons by sex having different types 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	13.2	4.1	9.2	2.2	11.1	3.0
Central Government Health Scheme	2.6	3.6	1.4	2.3	2.0	2.8
State Health Insurance Scheme	0.4	77.4	0.4	77.9	0.4	77.7
Rashtriya Swasthya Bima Yojana	2.0	2.7	2.2	2.9	2.1	2.8
Other health insurance through employer	0.0	2.8	0.5	1.3	0.3	1.9

Medical reimbursement from employer	0.5	0.5	0.0	0.3	0.2	0.4
Other privately purchased commercial health insurance	0.4	0.0	0.8	2.0	0.6	1.2
Other	0.0	4.2	1.7	3.8	0.9	3.9
No health scheme/ insurance coverage	82.3	21.4	84.2	21.4	83.3	21.4
Have more than one insurance	1.4	16.7	0.5	14.0	0.9	15.2
Total percent	100.0	100	100.0	100	100.0	100
Number of cases	201	189	212	269	413	458

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, about one-third of the males reported that they had 'never smoked' and in the end-line, about 54% of them responded that they had never smoked. There was no change in drinking habits among males between baseline and end-line surveys.

Table 8: Percentage distribution of adult CS persons 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
Smoke cigarettes/bidis						
Current smoker	48.6	29.8	0.5	0.5	23.9	12.6
Past smoker	18.5	16.3	0.0	0.3	9.0	6.9
Never smoked	32.9	53.9	99.5	99.2	67.1	80.5
Drink alcohol						
Almost every day	27.3	22.5	0.0	0.0	13.3	9.3
About once a week	19.0	13.6	1.2	0.0	9.8	5.6
Less than once a week	3.6	10.3	0.5	1.2	2.0	5.0
Never	50.1	53.5	98.3	98.8	74.8	80.1
Total percent	100	100	100	100.0	100	100
Number of cases	201	189	212	269	413	458

04

KNOWLEDGE ABOUT KEY ASPECTS OF TB



Knowledge about key aspects of TB

We asked all the adult CS persons 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 persistent cough for two weeks or more. The results are presented in Table 9. Almost an equal proportion of respondents in both baseline and end-line reported that the disease condition could be TB, if a person has persistent cough for two or more weeks. In addition, in the end-line survey, other frequently reported disease conditions were seasonal cold (34%) and throat infection (24%). About 15% of the respondents in the baseline survey reported these disease conditions. However, the proportion of respondents who did not know or couldn't say the name of the disease condition reduced between baseline and end-line surveys.

Table 9: Percentage distribution of adult CS persons 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	13.8	24.9	14.4	29.2	14.1	27.4
Seasonal cold	14.8	30.2	15.3	37.4	15.0	34.4
Viral fever	5.1	6.3	8.5	6.7	6.8	6.6
Tuberculosis	38.3	39.6	33.8	34.4	36.0	36.6
Pleurisy	2.7	2.9	3.5	4.0	3.1	3.5
Chest congestion	2.5	2.0	2.3	2.6	2.4	2.3
Asthma/COPD	14.1	9.6	18.1	14.3	16.1	12.3
Others	3.8	18.2	4.8	11.4	4.3	14.2
Don't know/Can't say	18.4	8.2	19.1	7.8	18.8	8.0
Number of cases	201	189	212	269	413	458

We also examined the proportion of adult CS persons 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 significant increase in proportion of respondents who knew or had heard of TB between baseline and end-line surveys, irrespective of the background characteristics. Overall, the proportion of respondents who knew or had heard of TB significantly increased from 67% in the baseline to 88% in the end-line survey. This significant increase in knowledge of TB cut across gender, age, religion, literacy, occupation and income and was not significant only where the baseline score was already high.

Table 10: Percentage distribution of adult CS persons 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	
Sex of the respondent					
Male	68.0	201	91.8	189	<0.001
Female	66.5	212	85.9	269	<0.001
Age					
< 40	77.6	151	92.1	183	<0.001
40-59	69.4	149	86.1	168	<0.001
60+	50.7	113	85.3	107	<0.001
Marital status					
Currently married	68.2	278	89.5	311	<0.001
Widowed/Divorced/Separated	57.2	94	84.3	110	<0.001
Never married	84.3	41	90.4	37	0.423
Literacy and education					
Illiterate	56.8	166	84.7	194	<0.001
Literate, 1-7 years of schooling	66.9	117	84.6	110	0.002
8+ years of schooling	80.9	130	95.5	154	<0.001
Occupation					
Business	75.0	25	95.4	64	0.011
Salaried job	76.5	16	100.0	31	NE
Other job	70.9	179	88.7	180	<0.001
Not working	60.7	60	83.5	184	<0.001
Religion					
Hinduism	67.1	303	89.0	362	<0.001
Islam	73.4	80	84.9	54	0.119
Other	51.9	30	87.0	42	0.002
Caste/Tribe					
Scheduled Caste/Tribe	68.9	200	90.1	262	<0.001
Others	65.7	213	85.9	196	<0.001

Monthly income (in ₹)					
< 5000	65.7	252	84.1	243	<0.001
5000+	69.7	161	93.1	215	<0.001
Household monthly income (in ₹)					
< 15000	67.3	263	84.5	212	<0.001
15000+	67.3	150	91.6	246	<0.001
Total	67.3	413	88.3	458	<0.001

All the CS persons 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 on TB were TB among friends or relatives (45%), word of mouth from friends or relatives (39%) and television or radio (30%). In the end-line, comparatively more males (39%) than females (24%) reported television as their source of information on TB. However, in the baseline survey, the most frequently reported sources of information on TB were word of mouth from friends or relatives (43%), TB among friends or relatives (32%) and television or radio (24%). A comparatively higher proportion of respondents in the end-line (14%) reported that the DOTS provider or the government health worker was the source of information as compared to baseline survey (5%), but this proportion still remains small.

Table 11: Percentage distribution of adult CS 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	22.1	38.7	24.7	24.1	23.5	30.4
Newspaper/ Magazine	9.3	2.6	6.2	7.3	7.7	5.2
Posters/ Banners/ Hoardings/ Campaigns	3.4	4.1	6.2	6.0	4.8	5.2
Word of mouth from friends/ relatives	39.7	41.1	46.0	37.6	42.9	39.1
TB among friends/relatives	29.7	43.1	34.9	46.1	32.3	44.8
DOTS provider/health worker	2.1	11.6	7.2	15.5	4.7	13.8
Anganwadi worker	1.5	3.7	2.2	5.8	1.8	4.9
Community meetings	1.9	2.9	0.0	7.8	0.9	5.7
Workplace	5.7	2.0	3.2	1.1	4.5	1.5
Schools/ Teachers	1.6	1.1	2.1	1.2	1.9	1.2
Telephone helpline	0.0	0.0	1.4	1.1	0.7	0.6
Respondent had TB	24.0	10.4	9.2	3.8	16.5	6.6
Others	10.8	8.5	10.5	9.8	10.7	9.3
Number of cases	137	173	141	231	278	404

We asked all respondents about the most common symptoms of lung TB. We found that there was an increase in the proportion of CS persons who reported that cough was the most common symptom of the lung TB between the baseline (44%) and end-line (74%) surveys (see Table 12). The reporting of cough as the symptom was slightly higher among males than females in both baseline and end-line surveys.

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	46.0	77.8	41.5	71.3	43.7	74.0
Fever	1.0	3.9	0.4	5.8	0.7	5.0
Night sweats	0.4	0.0	0.5	0.4	0.4	0.3
Weight loss	11.0	6.3	13.3	4.6	12.2	5.3
Weakness	2.4	0.5	1.1	0.0	1.8	0.2
Chest pain	0.0	1.8	1.0	0.7	0.5	1.2
Others	7.2	1.4	8.3	3.2	7.7	2.4
Don't know	31.9	8.2	33.9	14.1	33.0	11.7
Number of cases	201	189	212	269	413	458

We asked adult CS persons about the mode of transmission of TB. We noticed a 20 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 about the mode of transmission of TB was reduced between baseline and end-line survey. Surprisingly, although there was an improvement in the correct response for the mode of transmission, there was an increase in the proportion of CS persons giving incorrect responses such as through food (16% vs. 25%) and stepping on sputum (5% vs. 18%) between baseline and end-line surveys.

Table 13: Percentage distribution of adult CS persons by sex according to knowledge on mode of transmission of TB 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	53.3	76.6	51.4	68.5	52.3	71.8
Sharing utensils	3.6	11	4.3	8.8	3.9	9.7
Touching a person with TB	3.4	12.1	3.5	13.5	3.4	12.9
Food	17.7	24.8	14.6	24.7	16.1	24.7
Sexual contact	0.6	0.5	1	1.2	0.8	0.9
Mosquito bites	0.9	2.5	0.4	2.4	0.7	2.4
Stepping on sputum	5.9	18.3	3.8	18.4	4.9	18.4
Other	1.1	3.8	1.4	2.9	1.3	3.2
Don't know/Can't say	43.0	18.9	45.2	17.1	44.2	17.9
Number of cases	201	189	212	269	413	458

We asked adult CS persons 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 (22%) than in the baseline (11%) reported prompt diagnosis and treatment as a way to prevent the spread of 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 (44%) and end-line (36%) surveys. The reduction was comparatively higher for females (42% vs. 31%) than males (46% vs. 43%). However, a comparatively higher percentage of respondents in the end-line (37%) as compared to baseline (18%) reported that wearing a mask can prevent the spread of TB, with an increase of about 19 percentage points. However, more than one-third of the respondents in both baseline and end-line surveys did not know or could not say the ways to prevent the spread of TB.

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, 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	46.3	42.8	41.7	31.4	43.9	36.1
Wearing mask	20.5	42.8	16.5	32.9	18.4	37.0
Good ventilation	8.0	11.9	4.1	7.9	6.0	9.6
Prompt diagnosis and treatment	12.1	22.1	10.7	21.4	11.4	21.7
Vulnerable persons like children to take medicines to prevent TB	1.5	3.3	1.5	1.8	1.5	2.4
Good nutrition	6.1	10.6	5.5	8.6	5.8	9.4
Other	1.7	13.0	4.0	8.4	2.9	10.3
Don't know/Can't say	39.7	32.4	45.1	38.4	42.4	36.0
Number of cases	201	189	212	269	413	458

We asked respondents about the confirmatory test for TB. The results are provided in Table 15. There was a significant increase in the proportion of respondents who said that sputum test is the confirmatory test for TB between baseline and end-line surveys. The reporting of sputum test as confirmatory increased by 14 percentage points between baseline and end-line surveys. However, nearly half of the respondents still considered blood tests as the confirmatory test for the diagnosis of tuberculosis. We did not notice any significant difference in the response for confirmatory test for TB according to the sex of the respondent.

Table 15: Percentage distribution of adult CS persons by sex who reported specific confirmation 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	50.5	54.5	43.2	48.8	46.7	51.1
Sputum test	59.4	75.1	57.0	70.5	58.2	72.4
Blood test	55.4	45.1	55.0	50.0	55.2	48.0
Mantoux tuberculin/skin test	10.3	5.9	9.0	5.5	9.6	5.7
Tissue biopsy	7.6	8.6	9.7	4.5	8.7	6.2
Other test	1.7	10.4	7.8	15.5	4.8	13.4
Number of cases	201	189	212	269	413	458

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 municipal corporation hospital (44% vs. 54%), government TB hospital (25% vs. 34%) and other government hospitals (1% to 16%) were places where the test could be done. In the end-line, comparatively more males (61%) than females (49%) reported the municipal corporation hospital as the place where adults could be tested for TB. However, we noticed that the proportion of respondents who did not know or couldn't say about the testing centres reduced from 38% in the baseline to 21% in the end-line survey.

Table 16: Percentage distribution of adult CS persons 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	45.1	61.2	43.5	49.2	44.3	54.1
Government TB hospital	28.0	30.6	21.4	35.5	24.6	33.5
Other government hospital	1.1	15.9	0.7	16.3	0.9	16.1
Designated Microscopy Centre	0.0	0.0	1.4	0.0	0.7	0.0
Private hospital	5.4	10.6	13.4	11.9	9.5	11.3
Private clinic	2.9	5.8	1.2	4.5	2.0	5.0
AYUSH hospital/ Clinic	0.4	1.4	0.0	1.8	0.2	1.6
Others	1.1	0.7	0.0	1.8	0.5	1.3
Medical college	0.0	0.0	0.0	0.7	0.0	0.4
Any private lab	0.0	2.6	0.0	5.5	0.0	4.3
Don't know/Can't say	37.7	17.0	38.5	24.0	38.2	21.1
Number of cases	201	189	212	269	413	458

We asked respondents where treatment for TB was available. The results are shown in Table 17. In both baseline and end-line surveys, most of the respondents mentioned the municipal hospital as the place where the treatment for TB was available. We noticed an increase of about 11 percentage points in the response that the municipal hospital is the place where TB treatment is available, between the baseline and end-line surveys. Similarly, the proportion of respondents who said that they did not know or could not say about the place where one could get TB treatment was reduced from 38% in the baseline to 26% in the end-line, with males showing the maximum reduction.

Table 17: Percentage distribution by sex of adult CS persons, 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	51.6	72.3	56.1	59.7	53.9	64.9
Government dispensary	21.0	16.6	10.2	21.2	15.5	19.3
DOT Centre	0.5	0.5	0.0	0.3	0.2	0.4
Government mobile clinic	0.6	6.5	0.4	2.7	0.5	4.3
ESI Hospital	1.0	1.5	1.3	0.9	1.2	1.2
Other public sector health facility	1.8	3.3	0.0	2.0	0.9	2.5
NGO or Trust Hospital/Clinic	0.0	0.9	1.6	0.0	0.8	0.4
Private hospital	17.2	5.3	14.3	6.1	15.7	5.8
Private doctor/clinic	1.6	2.1	0.6	0.3	1.1	1.1
Other private sector health facility	0.5	0.0	0.9	0.6	0.7	0.3
Don't know/Can't Say	36.3	17.9	38.8	31.5	37.7	25.9
Number of cases	201	189	212	269	413	458

Finally, we asked respondents about the cost and duration of treatment for TB. The results indicated that there was a slight increase between baseline and end-line, in the proportion of respondents saying that no cost needed to be incurred for TB treatment (see Table 18). For instance, in the baseline, 15% of the respondents said no cost would need to be incurred for TB treatment and this increased to 24% in the end-line survey. Surprisingly, nearly three-fifths of the CS persons were not aware about the cost of the TB treatment. About 10% and 5% of the respondents in the baseline and end-line suggested that the cost of treatment could be ₹10000 or higher.

A slightly higher percentage of the respondents in the end-line (26%) as compared to baseline (22%) reported that six months is the duration for TB treatment. However, nearly half of the CS persons did not know or could not say what the duration of the treatment was in the end-line survey. The results indicated that the knowledge about cost and duration of treatment did not improve as much as other knowledge aspects discussed previously.

Table 18: Percentage distribution by sex of adult CS persons who reported different costs and duration for treatment of TB in the baseline and end-line surveys, Bengaluru

Item	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Cost of treatment (in ₹)						
No cost	18.0	29.0	11.6	20.9	14.7	24.3
1 – 9999	2.0	11.5	1.2	7.9	1.6	9.4
10000+	10.8	4.5	9.5	5.8	10.1	5.2
Don't know/Can't say	69.3	55.0	77.7	65.3	73.5	61.1
Duration of treatment						
<6 months	17.3	23.4	12.9	18.7	15.1	20.6
6 months	22.6	28.5	21.2	24.9	21.9	26.4
6+ months	6.7	4.9	9.8	5.0	8.3	5.0
Don't know/Can't say	53.3	43.2	56.1	51.4	54.8	48.0
Number of cases	201	189	212	269	413	458

We read out two statements; “TB is fully curable” and “All TB patients need admission in hospitals for treatment” to the CS persons and recorded their response on a five score Likert scale. Fifty-nine percent in the baseline and 75% in the end-line either agreed or strongly agreed to the statement that “TB is fully curable”. Similarly, the proportion of CS persons who could not answer this question was reduced from 38% in the baseline to 16% in the end-line. Regarding the statement “All TB patients need admission in hospitals for treatment”, 59% in the baseline and 67% in the end-line either agreed or strongly agreed. The proportion of respondents who agreed to this statement was increased mainly because more males in the end-line strongly agreed.

Table 19: Percentage distribution by sex of adult CS persons according to their opinion on whether TB is fully curable and whether 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
TB is fully curable						
Strongly agree	49.0	69.1	44.6	55.9	46.7	61.3
Agree	10.9	10.1	12.8	15.4	11.9	13.2
Neither agree nor disagree	1.9	3.4	1.8	5.8	1.8	4.8
Disagree	0.9	4.1	1.5	4.4	1.2	4.3
Strongly disagree	0.0	1.2	1.1	0.0	0.5	0.5
Don't know/Can't say	37.2	12.1	38.3	18.5	37.8	15.9
All TB patients need admission in hospital for treatment						
Strongly agree	39.1	57.2	40.0	42.5	39.6	48.6
Agree	20.0	17.0	17.6	18.0	18.8	17.6
Neither agree nor disagree	0.8	7.4	2.5	7.5	1.7	7.5
Disagree	1.7	4.5	1.4	6.3	1.6	5.6
Strongly disagree	0.5	1.3	0.0	2.0	0.2	1.7
Don't know/Can't say	37.9	12.6	38.5	23.7	38.2	19.1
Number of cases	201	189	212	269	413	458

We asked the respondents about their willingness towards disclosure of TB status to other people. The results are provided in Table 20. We do not present the other 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 the status remained the same during both baseline and end-line surveys. In both baseline and end-line surveys, respondents stated that the person to whom a TB patient should disclose his/her TB status were spouse (71% vs. 74%), doctor (53% vs. 56%), parents (48% vs. 50%) and children (29% vs. 36%). In both baseline and end-line surveys, slightly more females reported spouse, parents and children as the persons to whom a TB patient should disclose their TB status.

Table 20: Percentage distribution by sex of respondents regarding the person 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	53.9	61.6	52.4	51.8	53.1	56.0
Spouse	67.2	71.9	74.6	75.0	71.0	73.7
Children	25.5	30.5	32.3	39.5	28.9	35.6
Parents	47.5	45.0	49.1	53.2	48.3	49.7
Siblings	10.8	8.9	5.4	11.6	8.1	10.5
Friends	5.2	19.0	6.8	9.6	6.0	13.7
Don't know/can't say	3.5	4.0	1.3	4.9	2.4	4.5
Number of cases	137	173	141	231	278	404

We asked respondents who agreed that a TB patient should disclose his or her status for the reasons why. In the end-line, the top responses for disclosure were treatment support (68%), family support (60%), quick treatment (48%) and emotional support (36%). In the end-line, comparatively more females than males reported treatment support and family support as the reasons for disclosure. However, in the baseline, the topmost responses were family support (48%), quick treatment (37%), treatment support (35%) and emotional support (24%) as the reasons for disclosure. Although, the topmost responses remained the same, the order changed between baseline and end-line surveys.

Table 21: Percentage distribution of adult CS persons by sex, according to reasons for disclosing TB status (among those who said that a person should disclose one's 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	40.0	52.2	34.7	44.7	37.3	47.9
Prevent spread	13.7	35.3	19.0	33.7	16.4	34.4
Emotional support	21.6	33.5	26.5	38.5	24.2	36.4
Family support	52.2	57.4	43.5	62.7	47.7	60.4
Treatment support	34.9	62.0	35.8	72.8	35.3	68.2
Financial support	23.1	10.4	21.0	19.1	22.0	15.4
Other	4.1	1.6	1.7	0.0	2.9	0.7
Number of cases	131	165	139	218	270	383

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 greatest proportion of responses related to neighbours (44% vs. 58%), friends (27% vs. 38%) and other relatives (25% and 28%). In all the answers mentioned above, we noticed an increase in the proportion of respondents who considered non-disclosure. In the end-line survey, the response of non-disclosure was more frequent for males than females.

Table 22: Percentage distribution by sex of adult CS persons according to whom a TB patient should not disclose his/her status (among those who knew 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
Children	7.8	0.0	7.8	10.6	7.8	4.4
Other relatives	21.7	38.4	28.0	12.6	25.0	27.5
Friends	33.7	65.7	20.5	0.0	26.9	38.1
School mates	4.7	0.0	5.9	0.0	5.3	0.0
Co-workers	12.7	0.0	4.6	0.0	8.6	0.0
Boss	10.4	8.5	8.4	0.0	9.4	4.9
Neighbours	43.1	83.8	44.0	23.1	43.6	58.3
Anybody	2.7	0.0	0.7	14.2	1.7	6.0
Other	0.6	0.0	1.5	28.6	1.1	12.0
Don't know/Can't say	14.7	6.8	19.8	34.1	17.3	18.2
Number of cases	136	173	141	231	278	404

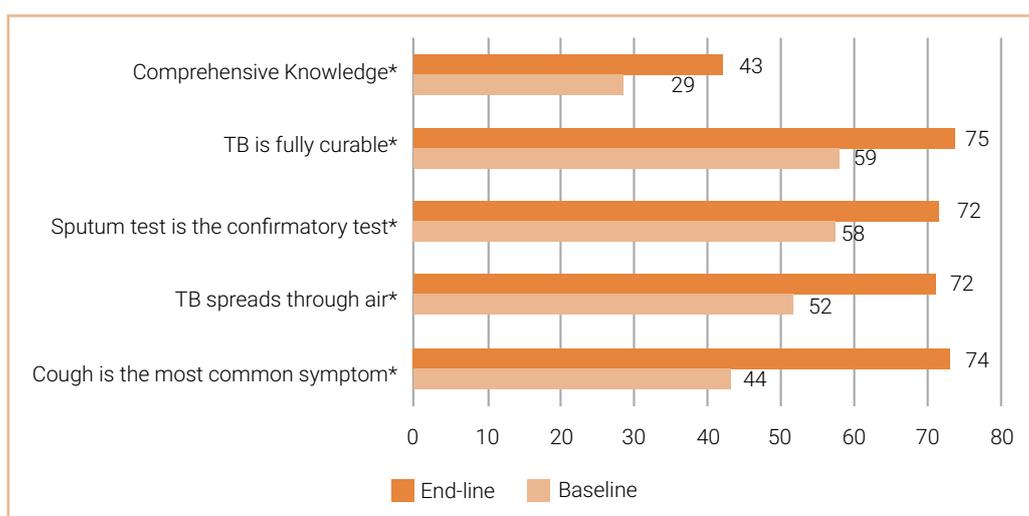
The reasons for non-disclosure were also examined and the results are shown in Table 23. In the end-line survey, the frequently reported reasons for non-disclosure of TB status were related to people in the community avoiding the TB patient (78%), the patient's family name being spoiled (61%) and the community trying to drive the patient out (27%). However, in the baseline, the patient's family name being spoiled (57%), people in the community avoiding the TB patient (24%) and the community trying to drive the patient out (20%) were the top three reported reasons for non-disclosure.

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

Reason for non-disclosure	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Our family name will be spoiled	60.3	62.4	52.7	60.1	56.5	61.1
People in the community will avoid him/her	18.8	76.0	30.0	79.8	24.3	78.2
People in the community will try to drive him/her out	23.9	25.6	15.2	27.3	19.6	26.6
Loss of job	10.9	4.2	10.1	5.7	10.5	5.1
Other	17	0.0	24.2	0.0	20.5	0.0
Don't know/Can't say	0.0	6.4	1.8	4.0	0.9	5.0
Number of cases	117	133	113	179	230	312

We devised a composite index based on four key knowledge aspects of TB to indicate comprehensive knowledge of TB among CS persons. 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 base line 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 (30 percentage points), followed by the aspects of TB spreading through air (20 percentage points), TB being curable (16 percentage points) and of sputum test being the confirmatory test (14 percentage points). Consequently, the comprehensive knowledge increased from 29% in baseline to 43% in the end-line survey, showing an increment of 14 percentage points.

Figure 1: Percentage of CS persons with comprehensive knowledge and its components, Bengaluru



Note: * difference is significant at 5% level

We also examined the changes in comprehensive knowledge between the baseline and end-line surveys among the CS persons, according to different characteristics. Overall, we noticed a significant increase in the comprehensive knowledge between baseline and end-line surveys (see Table 24). For most of the socio-economic and demographic characteristics, we identified a significant increase in comprehensive knowledge over the time period. However, though there was an increase in comprehensive knowledge for few of the categories of characteristics, we did not find the changes over the time period to be significant for persons whose age was less than 40 years, persons whose marriages were dissolved, persons who were engaged in jobs other than business and salaried jobs, persons who were Muslim, or belonged to religions other than Hinduism or Islam, and respondents whose personal monthly income was ₹5000 or more. The increase we noticed between baseline and end-line surveys was significantly higher for females, persons aged 40 and above, persons engaged in salaried jobs or unemployed, and those whose personal monthly income was less than ₹5000.

Table 24: Percentage distribution of respondents who have 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	
Sex of the respondent					
Male	32.8	201	45.1	189	0.013
Female	25.5	212	40.7	269	<0.001

Age					
< 40	34.8	151	42.0	183	0.180
40-59	26.2	149	42.4	168	0.002
60+	25.1	113	43.8	107	0.004
Marital status					
Currently married	29.6	278	43.8	311	<0.000
Marriage dissolved	26.4	94	37.8	110	0.083
Never married	31.3	41	46.1	37	0.180
Literacy and education					
Illiterate	22.6	166	36.6	194	0.004
Literate, 1-7 years of schooling	31.8	117	46.6	110	0.022
8+ years of schooling	34.7	130	47.1	154	0.035
Occupation					
Business	25.9	25	37.5	64	0.302
Salaried job	40.5	16	73.9	31	0.028
Other job	34.5	179	38.8	180	0.394
Not working	24.9	60	42.6	184	<0.001
Religion					
Hinduism	30.9	303	44.3	362	<0.001
Islam	26.6	80	36.4	54	0.228
Other	16.0	30	34.7	42	0.086
Caste/Tribe					
Scheduled Caste/Tribe	33.6	200	45.4	262	0.011
Others	24.8	213	38.7	196	0.003
Personal monthly income (in ₹)					
< 5000	25.4	252	42.6	243	<0.001
5000+	34.8	161	42.5	215	0.129
Household monthly income (in ₹)					
< 15000	28.0	263	39.6	212	0.010
15000+	30.8	150	45.1	246	0.005
Total	29.0	413	42.5	458	<0.001

Note: Comprehensive knowledge includes the fact 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.

05

HEALTH SEEKING BEHAVIOUR



Health seeking behaviour

We asked respondents what they did during the first two weeks and after two weeks of cough. The results are presented in Table 25. We noticed that there was an improvement in the respondents consulting a healthcare provider within the first two weeks of cough and also after two weeks of cough between the baseline and end-line surveys. Consequently, the proportion of CS persons who did nothing within first two weeks of cough and after two weeks of cough was reduced between baseline and end-line surveys. However, the proportion of respondents who tried home remedies also increased between baseline and end-line surveys within the first two weeks of cough and also after two weeks of cough. It was worth noting that the proportion of persons opting for self-medication within first two weeks of cough reduced between baseline and end-line surveys.

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

What all the respondent did	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Within first two weeks of cough						
Consulted a healthcare provider	50.2	65.4	50.7	63.1	50.4	64.1
Home remedies	10.8	20.8	11.4	35.0	11.1	29.2
Self-medication	25.3	19.9	22.5	17.6	23.8	18.6
Did nothing	15.6	12.0	16.6	5.1	16.1	7.9
After two weeks of cough						
Consulted a healthcare provider	64.3	73.2	65.5	68.2	64.9	70.3
Home remedies	0.5	8.1	1.9	14.1	1.2	11.6
Self-medication	7.2	5.2	8.2	8.1	7.7	6.9
Did nothing	28.1	21.2	25.8	19.4	26.9	20.2
Number of cases	201	189	212	269	413	458

We also enquired from CS persons about the number of times they visited the healthcare provider within the first two weeks of the cough and also after two weeks of cough. We noticed that respondents who consulted the healthcare provider three or more times drastically increased between baseline and end-line surveys both within first two weeks of cough and after two weeks of cough. The proportion of persons who did not visit a healthcare provider in the first two weeks of cough also reduced from 50% in the baseline to 36% in the end-line. However, it may be of some concern that in the end-line, 30% of the respondents had not visited a healthcare provider after two weeks of cough.

Table 26: Percentage distribution by sex of CS persons, according to number of visits to the healthcare provider during the first two weeks and after two weeks of cough in the baseline and end-line surveys, Bengaluru

Number of visits	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Within first two weeks of cough						
No visit to healthcare provider	49.8	34.6	49.3	36.9	49.6	35.9
1	36.4	20.2	39.0	24.9	37.7	23.0
2	11.7	22.0	9.0	22.7	10.3	22.4
3+	2.1	23.2	2.6	15.5	2.4	18.6
After two weeks of cough						
No visit to healthcare provider	35.7	26.8	34.5	31.8	35.1	29.7
1	30.8	19.3	32.7	27.2	31.8	23.9
2	26.8	30.8	24.4	24.7	25.5	27.2
3+	6.7	23.0	8.5	16.3	7.6	19.1
Number of cases	201	189	212	269	413	458

We also examined the responses specifically to understand the extent to which the respondents visited a healthcare provider during both the occasions, that is prior to two weeks of cough and after two weeks of cough, and the results are presented in Table 27. The results revealed that a little more than 10% of the CS persons in the baseline and end-line never visited any healthcare provider after the start of the cough. However, there was an increase in the proportion of respondents who visited the healthcare provider both in the first two weeks of cough and after two weeks of cough between baseline (28%) and end-line (46%) surveys.

Table 27: Percentage distribution by sex of CS persons who specifically visited healthcare providers in the first two weeks or after two weeks of cough in the baseline and end-line surveys Bengaluru

Visited healthcare provider	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Not visited any healthcare provider at all	15.2	9.2	11.0	13.3	13.1	11.6
Visited only in the first two weeks	20.5	17.7	23.5	18.4	22.0	18.1
Visited only after two weeks	34.6	25.4	38.3	23.6	36.5	24.3
Visited in the first two weeks and after two weeks	29.7	47.7	27.2	44.7	28.4	45.9
Number of cases	201	189	212	269	413	458

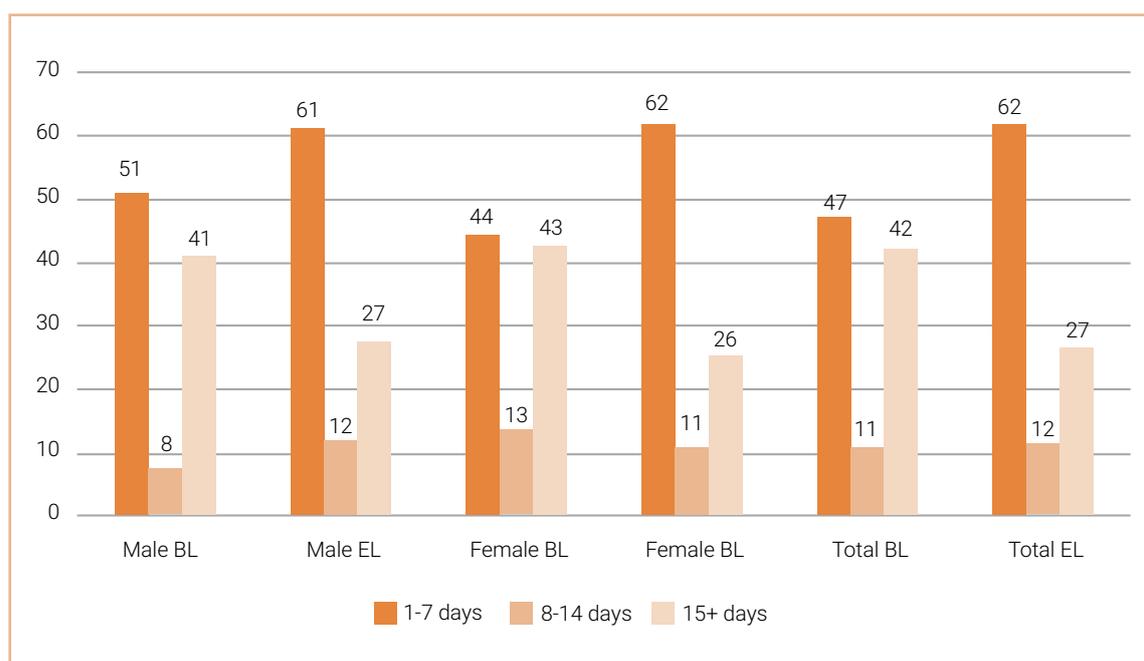
We asked all the CS persons who visited a health facility for treatment about the type of health facility they visited. The results are presented in Table 28. We observed slight declines in the proportion of CS persons consulting a public health facility between baseline and end-line surveys for both consultations visits within the first two weeks of cough and after two weeks of cough (see Table 28). However, we noticed a higher proportion of respondents reporting that they visited a pharmacy within the first two weeks of cough in the end-line than in the baseline. The proportion of respondents consulting a private health facility remained high in both baseline and end-line surveys for consultations within the first two weeks of cough and after two weeks of cough.

Table 28: Percentage distribution by sex of adult CS persons, according to the type of healthcare facility visited during the first two weeks and after two weeks of cough (among those who visited a healthcare provider), in the baseline and end-line surveys, Bengaluru

Type of healthcare provider visited	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Within first two weeks of cough						
Government /Municipal Hospital	45.9	34.3	33.7	28.7	39.6	31.1
Government dispensary	7.3	2.7	5.9	1.6	6.5	2.1
Other public sector health facility	1.7	2.0	0.0	0.0	0.8	0.9
NGO or trust hospital/clinic	4.9	0.0	5.9	0.4	5.4	0.2
Private hospital	35.3	9.6	44.5	13.1	40.1	11.6
Private doctor/clinic	12.6	42.7	18.4	50.0	15.6	46.9
Pharmacy/drug store	0.0	17.9	2.2	12.8	1.2	14.9
Number of cases	101	123	107	170	208	293
After two weeks of cough						
Government /Municipal Hospital	60.9	48.4	35.6	25.7	47.8	35.4
Government dispensary	10.6	6.4	10.7	3.5	10.6	4.8
Other public sector health facility	2.9	2.6	0.0	0.4	1.3	1.3
NGO or trust hospital/clinic	2.6	1.1	2.2	0.0	2.4	0.5
Private hospital	33.7	7.9	56.7	23.1	45.6	16.5
Private doctor/clinic	9.6	53.2	11.1	59.2	10.4	56.6
Pharmacy/drug store	0.0	3.5	0.8	1.2	0.4	2.2
Number of cases	129	138	139	184	268	322

We asked the respondents to state the number of days after the cough that they first visited the health facility. Figure 2 provides the distribution of the respondents according to the number of days after the cough that they first visited the health facility. We noticed that there was a significant change in the proportion of persons consulting a health facility within the first seven days of cough and after 14 days of cough between baseline and end-line surveys, irrespective of the sex of the respondent. For example, the proportion of respondents who first visited the health facility within first 7 days of cough increased from 47% in the baseline to 62% in the end-line. As a result, the average number of days between the start of the cough and first consulting a health facility reduced from 13 days in the baseline to 8 days in end-line. We also noticed that there was a reduction in the proportion of respondents first visiting the health facility after 14 days of cough between baseline and end-line surveys.

Figure 2: Percentage of CS persons according to the number of days after cough that they visited a health care facility, Bengaluru



We also asked the respondents to mention recommendations by the healthcare provider during the visits within first two weeks of cough and after two weeks of the cough. Referrals for diagnostic tests increased from 54% in the baseline to 62% in the end-line after two weeks of cough and the increment was mainly observed among females (see Table 29). Similarly, prescriptions for medicines also increased between the baseline and end-line within first two weeks of cough and after two weeks of cough.

Table 29: Percentage distribution by sex of adult CS persons, according to type of recommendations made by the healthcare provider within first two weeks and after two weeks of cough (among who visited a healthcare provider), in the baseline and end-line surveys, Bengaluru

Actions by the healthcare provider	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Within first two weeks of cough						
Referred for a diagnostic test	27.6	13.9	25.2	14.4	26.4	14.2
Drug/medicine prescribed	78.0	93.2	79.0	88.3	78.5	90.4
Referred to another service provider	1.7	0.7	2.4	0.0	2.1	0.3
Hospitalization	0.0	3.5	1.6	2.8	0.8	3.1
Gave nebulization	5.1	11.3	2.7	8.2	3.9	9.5
Gave injection	18.9	51.1	29.2	54.6	24.2	53.1
Others	0.0	8.1	0.0	6.1	0.0	6.9
Number of cases	101	123	107	170	208	293
After two weeks of cough						
Referred for a diagnostic test	57.9	55.8	50.4	67.4	54.0	62.4
Drug/medicine prescribed	57.0	82.1	62.7	86.9	59.9	84.9

Referred to another service provider	2.4	11.3	3.4	1.5	2.9	5.7
Hospitalization	3.3	4.1	2.2	8.4	2.7	6.6
Gave nebulization	7.9	17.1	4.0	19.8	5.9	18.6
Gave injection	38.3	41.9	49.1	40.9	43.9	41.4
Other	0.7	1.3	0.0	1.9	0.4	1.7
Number of cases	129	138	139	184	268	322

We asked the respondents who visited a healthcare provider about the type of test that had been recommended. Overall, we noticed that there was no change in the recommendation for the diagnostic tests, specifically for sputum test and chest X-Ray within the first two weeks of cough and after two weeks of cough (see Table 30). However, comparatively, more females reported that the healthcare provider recommended a sputum test and blood test between baseline and end-line surveys within two weeks of cough and after two weeks of cough.

Table 30: Percentage distribution of adult CS persons, by sex according to type of test prescribed within first two weeks and after two weeks of cough (among those who visited a healthcare provider) in the baseline and end-line surveys, Bengaluru

Type of test recommended	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Within first two weeks of cough						
Chest X-Ray	14.4	9.4	8.8	7.3	11.5	8.2
Sputum test	21.2	8.7	10.6	8.6	15.7	8.6
Blood test	14.5	11.2	17.7	9.2	16.1	10.1
Other	3.3	3.4	3.6	1.1	3.5	2.0
Number of cases	101	123	107	170	208	293
After two weeks of cough						
Chest X-Ray	42.9	35.3	35.2	36.7	39.0	36.1
Sputum test	51.8	41.1	34.5	43.8	42.8	42.6
Blood test	44.6	40.2	38.9	51.8	41.7	46.8
Other	2.5	2.7	4.8	3.1	3.7	2.9
Number of cases	129	138	139	184	268	322

We examined the specific diagnostic tests recommended according the type health facility visited. The results are presented in Table 31. There was no change in the recommendations for sputum test and chest X-Ray after two weeks of cough among respondents who visited only public health facilities during their consultations between baseline and end-line surveys. However, we noticed a slight increase in the recommendation for sputum test among respondents who visited only a private healthcare provider between baseline (33%) and end-line surveys (40%). Further, we noticed that the recommendation for sputum test was reduced between baseline (51%) and end-line (40%) surveys, if the respondent visited both private and public health facilities after two weeks of cough. We also noticed that recommendations for blood tests increased between baseline and

end-line surveys for respondents who visited only public health facilities (44% vs. 52%) and those who visited only private health facilities (36% vs. 44%). Recommendations for both chest X-Ray and sputum tests were reduced for respondents who visited only public health facilities (37% vs. 29%) and who visited only private facilities (27% vs. 19%).

Table 31: Percentage distribution by sex of adult CS persons, according to type of test prescribed after two weeks of cough by type of health facility visited (among those who visited a healthcare provider) in the baseline and end-line surveys, Bengaluru

Type of health facility	Type of test prescribed						Number of cases
	Chest X-Ray	Sputum test	Blood test	Only chest X-Ray	Only sputum test	Both chest X-Ray and sputum test	
Baseline survey							
Public facility only	45.6	51.0	44.3	8.2	13.6	37.4	114
Private facility only	33.8	32.8	36.1	7.2	6.2	26.6	124
Both private and public	29.1	51.3	48.9	5.1	27.4	23.9	25
End-line survey							
Public facility only	48.3	48.4	52.0	19.0	19.2	29.2	100
Private facility only	30.9	40.2	43.7	12.1	21.3	18.8	187
Both private and public	30.4	40.0	50.1	9.8	19.4	20.6	34

We asked respondents about the support received during the consultation visits. We noticed a slight decline in the proportion of respondents saying that someone always accompanied them during their visit to the healthcare provider between baseline (57%) and end-line survey (50%). Consequently, the proportion of respondents who said that no-one accompanied them during their visit to the healthcare provider increased from 11% in the baseline to 24% in the end-line survey.

Table 32: Percentage distribution of respondents by sex according to the frequency of someone accompanying them during consultation visits (among respondents who visited a healthcare provider after two weeks of cough) in the baseline and end-line surveys, Bengaluru

	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Frequency of someone accompanying the respondent						
Always	59.6	47.9	55.1	51.5	57.3	49.9
Some times	29.0	25.3	34.0	26.9	31.6	26.2
No one accompanied	11.3	26.8	11.0	21.6	11.1	23.9
Number of cases	129	138	139	184	268	322

We enquired about the medical costs incurred by respondents who visited a healthcare provider after two weeks of cough. Surprisingly, we noticed a sharp decline in the average cost of medical expenses incurred by the CS persons between baseline and end-line surveys (see Table 33). The mean medical cost was reduced from ₹5197 in the baseline to ₹1281 in the end-line. This was mainly due to the huge increase in the respondents who reported that they had spent less than ₹1000 towards medical expenditures between baseline (20%) and end-line (49%). Similarly, there was a significant reduction in the proportion of respondents who said that they paid ₹5000 or more between baseline and end-line surveys. The percentage of respondents who said that they could not say how much they had paid towards medical costs was reduced between the baseline (18%) and end-line (5%) surveys.

Table 33: Percentage distribution by sex of respondents, according to total cost incurred for treatment (among those who visited a healthcare provide after two weeks of cough), in the baseline and end-line surveys, Bengaluru

Cost incurred (in ₹)	Male		Female		Total	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
No cost	6.5	11.7	9.3	10.9	8.0	11.3
< 1000	18.0	54.5	21.7	45.3	20.0	49.2
1000-4999	25.0	25.0	25.6	33.1	25.3	29.6
5000-9999	16.3	4.2	15.8	4.8	16.0	4.5
10000+	15.2	0.0	10.2	1.3	12.6	0.8
Don't know/Can't say	19.1	4.6	17.5	4.6	18.2	4.6
Mean cost incurred	6118.7	1054.8	4354.9	1451.5	5197.4	1281.3
Number of cases	129	138	139	184	268	322

Overall, we noticed that the proportion of respondents who sought treatment from a qualified healthcare provider after two weeks of cough significantly increased from 64% in the baseline to 70% in the end-line survey. Although we noticed an increase in the proportion of respondents who sought treatment from a qualified healthcare provider between baseline and end-line surveys, it was found to be statistically significant only for males, currently married persons, persons who are illiterate, persons engaged in jobs other than business and salaried jobs either in private or government, Muslims, persons neither Scheduled Caste nor Scheduled Tribe, persons whose monthly income was ₹5000 or more and persons whose household monthly income was less than ₹15000, as compared to their counterparts.

Table 34: Percentage distribution of respondents who sought treatment from a qualified health professional after two weeks of cough by selected characteristics, in the baseline and end-line surveys, Bengaluru

Characteristics	Baseline		End-line		p-value
	Percent	Number of cases	Percent	Number of cases	
Sex of the respondent					
Male	63.1	201	73.2	187	0.035
Female	64.1	212	67.9	271	0.377
Age					
< 40	57.8	151	66.5	184	0.103
40-59	66.4	149	73.8	165	0.147
60+	67.8	113	70.4	109	0.688
Marital status					
Currently married	63.0	278	71.6	306	0.027
Widowed/Divorced/Separated	65.3	94	69.0	111	0.575
Never married	63.7	41	60.2	41	0.751
Literacy and education					
Illiterate	65.9	166	75.9	198	0.038
Literate, 1-7 years of schooling	65.7	117	69.6	110	0.528
8+ years of schooling	58.9	130	63.0	150	0.470
Occupation					
Business	54.2	25	66.1	57	0.299
Salaried job	59.6	16	61.6	31	0.891
Other job	63.0	179	73.4	180	0.034
Not working	65.8	193	69.6	190	0.429
Religion					
Hinduism	65.3	303	68.6	357	0.370
Islam	54.1	80	76.0	56	0.011
Other	72.3	30	75.3	45	0.78
Caste/Tribe					
Scheduled Caste/Tribe	67.5	200	68.5	260	0.815
Others	60.0	213	72.2	198	0.010
Personal monthly income (in ₹)					
< 5000	64.8	252	68.1	247	0.430
5000+	61.8	161	72.3	211	0.032
Household monthly income (in ₹)					
< 15000	59.3	263	71.2	214	0.007
15000+	71.2	150	69.1	244	0.662
Total	63.6	413	70.1	458	0.043

Further, we also examined the changes in the proportion of respondents who sought treatment from a qualified healthcare provider after two weeks of cough according to the comprehensive knowledge and its components (see Table 35). We noticed a greater increase in the respondents seeking care from a qualified healthcare provider after two weeks of cough between baseline and end-line for those who had comprehensive knowledge, but it was not significant. However, we noticed a significant and larger increment in the proportion of respondents who sought treatment from a healthcare provider after two weeks of cough between baseline and end-line surveys for those who said that TB spreads through air (62% vs. 71%), sputum test is the confirmatory test (61% vs. 72%), and TB is fully curable (63% vs. 72%).

Table 35: Percentage distribution of respondents who sought treatment from a qualified health professional after two weeks of cough by comprehensive knowledge on TB and its components, in the baseline and end-line surveys, Bengaluru

Knowledge components	Baseline		End-line		p-value
	Percent	Number of cases	Percent	Number of cases	
Comprehensive knowledge					
No	63.3	293	67.9	263	0.252
Yes	64.4	120	73.0	195	0.109
Cough is the most common symptom of TB					
No	63.6	233	68.3	119	0.380
Yes	63.7	180	70.7	339	0.103
TB spreads through air					
No	66.0	197	67.2	131	0.826
Yes	61.5	216	71.2	327	0.018
Sputum is the confirmatory test for TB					
No	67.5	173	65.6	125	0.742
Yes	60.9	240	71.8	333	0.006
TB is fully curable					
No	64.6	171	64.2	120	0.952
Yes	63.0	242	72.1	338	0.020

We also examined the proportion of respondents who themselves asked for sputum test. The results indicate that there was a highly significant increase in the proportion of respondents requesting for a sputum test between baseline (4%) and end-line (20%) surveys. The increment was significant across all the categories of the socio-economic and demographic characteristics, except among salaried workers.

Table 36: Percentage distribution of respondents who asked for sputum test by selected characteristics in the baseline and end-line surveys, Bengaluru

Characteristics	Baseline		End-line		p-value
	Percent	Number of cases	Percent	Number of cases	
Sex of the respondent					
Male	4.2	201	27.5	187	<0.001
Female	3.0	212	15.3	271	<0.001
Age					
< 40	7.0	151	20.1	184	0.001
40-59	1.5	149	24.8	165	<0.001
60+	1.7	113	13.6	109	0.005
Marital status					
Currently married	3.8	278	20.8	306	<0.001
Marriage dissolved	0.9	94	17.1	111	<0.001
Never married	8.7	41	26.2	41	0.049
Literacy and education					
Illiterate	1.8	166	20.0	198	<0.001
Literate, 1-7 years of schooling	3.2	117	26.3	110	<0.001
8+ years of schooling	6.2	130	16.5	150	0.005
Occupation					
Business	0.0	25	23.3	57	NE
Salaried job	5.9	16	22.1	31	0.128
Other job	5.5	179	24.6	180	<0.001
Not working	2.1	193	14.9	190	<0.001
Religion					
Hinduism	4.2	303	19.5	357	<0.001
Islam	1.3	80	27.1	56	<0.001
Other	3.5	30	18.8	45	0.038
Caste/Tribe					
Scheduled Caste/Tribe	4.8	200	19.8	260	<0.001
Others	2.4	213	21.0	198	<0.001
Personal monthly income (in ₹)					
< 5000	3.6	252	14.9	247	<0.001
5000+	3.6	161	26.5	211	<0.001
Household monthly income (in ₹)					
< 15000	3.0	263	22.5	214	<0.001
15000+	4.6	150	18.5	244	<0.001
Total	3.6	413	20.4	458	<0.001

Table 37 provides the distribution of the respondents who asked for the sputum test according to comprehensive knowledge and its components. Unlike the results related to seeking treatment from a healthcare provider, we noticed a statistically significant increase in the proportion of respondents who asked for a sputum test between baseline and end-line surveys according to comprehensive knowledge and its component indicators. We noticed that a higher proportion of respondents asked for sputum tests among those who have knowledge on different key aspects of TB such as cough being the most common symptom of lung TB, TB spreading through air, sputum test being the confirmatory test for TB, and TB being fully curable in both baseline and end-line surveys.

Table 37: Percentage distribution of respondents who asked for sputum test by comprehensive knowledge on TB and its components in the baseline and end-line surveys, Bengaluru

Knowledge components	Baseline		End-line		p-value
	Percent	Number of cases	Percent	Number of cases	
Comprehensive knowledge					
No	1.8	293	12.3	263	<0.001
Yes	7.9	120	31.3	195	<0.001
Cough is the most common symptom of lung TB					
No	1.2	233	10.3	119	0.001
Yes	6.6	180	23.9	339	<0.001
TB spreads through air					
No	2.0	197	10.9	131	0.001
Yes	5.1	216	24.1	327	<0.001
Sputum is the confirmatory test for TB					
No	2.5	173	0.0	125	NE
Yes	4.3	240	28.1	333	<0.001
TB is fully curable					
No	1.7	171	8.7	120	0.005
Yes	4.9	242	24.3	338	<0.001

We asked respondents who did not consult a healthcare provider after two weeks of cough for the reasons they did not seek treatment. We noticed some difference in the reported reasons for not going to a healthcare provider between baseline and end-line surveys (see Table 38). In the end-line survey, the top three reported reasons were, they did not think it was necessary (43%), did not have time (17%), and felt better before they could seek treatment (17%). However, the frequently reported reasons in the baseline survey were that they did not think it was necessary (29%), felt better before they could seek treatment (29%) and thought it was not serious (18%). About 2% in the baseline and 8% in the end-line reported continuing the same medicine as earlier prescribed as the reason for not going to the healthcare provider after two weeks of cough.

Table 38: Percentage distribution by sex of respondents according to reasons for not seeking treatment from a healthcare provider after 2 weeks of cough in the baseline and end- line surveys, Bengaluru

Reasons for not seeking treatment	Male		Female		p-value	
	Baseline	End-line	Baseline	End-line	Baseline	End-line
Did not have time	12.4	16.7	8.0	17.2	10.2	17.0
Felt better before I could seek treatment	33.1	13.7	25.2	18.4	29.1	16.6
Treatment is costly	8.9	6.8	17.1	3.4	13.1	4.6
Did not think it was necessary	20.6	43.7	38.2	43.0	29.4	43.2
Did not know where to seek treatment	6.4	5.4	4.3	3.2	5.3	4.0
Healthcare provider is too far	0.0	0.0	2.4	2.1	1.2	1.3
Embarrassed to seek treatment	1.4	4.4	1.5	4.7	1.4	4.6
Thought I knew what the problem was and could treat it myself	6.7	5.1	1.2	0.0	3.9	1.9
Thought it was not serious	21.8	1.7	13.2	1.2	17.5	1.4
Continued the same medicine	2.6	7.3	0.8	8.1	1.7	8.1
Other	19.1	5.7	10.5	11.3	14.8	9.2
Don't know/Can't say	2.4	3.4	1.4	2.3	1.9	2.7
Number of cases	72	51	73	85	145	136

We also examined the profile of the respondents who never sought treatment from a healthcare provider. We noticed a change in the distribution of the respondents who did not seek treatment from the healthcare provider for most of the characteristics (see Table 39). Among the respondents who did not seek treatment from a healthcare provider, we identified that the proportion of females (43% vs. 68%), literate person who completed 1-7 years of school (29% vs. 42%), Hindus (59% vs. 85%), persons from a Scheduled Caste/Tribe (32% vs. 62%), and those with a household monthly income of ₹15000 or more (23% vs. 52%) comparatively increased between baseline and end-line surveys.

Table 39: Socio-economic and demographic profile of adult CS persons who did not seek treatment at all from a healthcare provider in the baseline and end-line surveys, Bengaluru

Characteristics	Baseline	End-line
Sex of the respondent		
Male	56.9	32.5
Female	43.1	67.5
Age		
< 40	39.3	44.4
40-59	35.7	39.1
60+	25.0	16.5
Marital status		
Currently married	70.6	64.5
Widowed/Divorced/Separated	20.8	29.2
Never married	8.6	6.3
Literacy and education		
Illiterate	40.7	28.4
Literate, 1-7 years of schooling	28.5	41.7
8+ years of schooling	30.8	29.9
Occupation		
Business	10.6	20.7
Salaried job	5.2	13.4
Other job	43.4	29.5
Not working	40.9	36.3
Religion		
Hinduism	58.9	85.4
Islam	34.9	5.6
Other	6.2	9.0
Caste/Tribe		
Scheduled Caste/Tribe	32.3	61.6
Others	67.7	38.4
Personal monthly income (in ₹)		
< 5000	55.0	55.5
5000+	45.0	44.5
Household monthly income (in ₹)		
< 15000	77.1	48.1
15000+	22.9	51.9
Total percent	100.0	100.0
Number of cases	54	53

06

PROGRAM IMPLICATIONS AND RECOMMENDATIONS



Exposure to THALI program

We enquired from the adult CS persons about their exposure to various THALI community engagement activities. These activities included exposure to various IEC materials, as well as communication activities to impart information on various key aspects to prevention, control and treatment carried out in 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 the public places and they were asked whether they had seen those materials. Table 40 provides the distribution of the respondents who had seen specific IEC materials and we noticed that about 72% 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 (46%), followed by the community handout leaflet (43%), the pourakarmika poster (28%), and construction worker poster (25%). A slightly greater proportion of males were reported to have seen these IEC materials.

Table 40: Percentage distribution of adult CS persons by sex who had seen specific IEC materials in the end-line survey, Bengaluru

Specific IEC material seen	Male	Female	Total
Cough hygiene - leaflet/poster	45.6	46.1	45.9
Community handout - leaflet	44.6	41.3	42.7
School brochure - leaflet	22.6	14.9	18.1
Construction worker - poster	31.3	20.3	24.8
Auto driver - poster	21.6	15.0	17.7
Pourakarmika - poster	24.6	30.0	27.8
Young girl - poster	15.5	17.5	16.7
Exposure to any of the above IEC materials	74.7	69.7	71.8
Number of cases	187	271	458

We asked CS adult persons who had seen the IEC materials about the place where or the person with whom they had seen those materials. We noticed that a little more than three-fourths of the respondents mentioned that the public hospital was the place where they had seen the IEC material. Petty shop/tea shops (26%) and Anganwadi centres (20%) were the other most frequently reported places where the respondents had seen the IEC material. Around 9% of the respondents reported that they had seen the materials with the KHPT/THALI CHW.

Table 41: Percentage distribution of adult CS persons according to the place where they have seen the IEC materials (among the persons who had seen the IEC materials) in the end-line survey, Bengaluru

Place where/person with whom the IEC material was seen	Male	Female	Total
KHPT/THALI CHW	9.9	7.8	8.7
Public Hospital	78.2	75.8	76.8
Anganwadi Centre	23.7	17.7	20.2
Petty shop/tea shop	35.0	20.0	26.4
SHG	1.8	1.0	1.3
Slum association	1.8	1.7	1.7

Youth group	2.1	1.4	1.7
Labour unions	6.2	7.0	6.7
Faith-based organization	0.0	0.5	0.3
Community Based Organizations	5.9	3.3	4.4
During public campaigns	5.0	5.8	5.5
Others (specify)	10.3	16.7	14.0
Don't know	6.7	7.5	7.2
Number of cases	141	188	329

We enquired about what message they had received after seeing the IEC materials. Nearly half of the respondents who had seen the IEC materials mentioned that covering one's mouth while coughing to prevent the spread of TB was information learned from the IEC material. Other respondents said that the messages they received involved understanding the common symptoms of TB (34%) and that TB patients should eat nutritious food (10%). However, it was surprising to note that one-quarter of the respondents were not able to state what information they received from the IEC materials. More males (14%) than females (2%) reported that the message they received from the IEC material was that TB can be fully cured.

Table 42: Percentage distribution of adult CS persons according to the information received from the IEC materials (among the persons who had seen the IEC materials), Bengaluru

Information received from the IEC materials	Male	Female	Total
Covering one's mouth while coughing prevents the spread of TB	44.9	54.5	50.4
Eat nutritious food	7.6	12.3	10.3
Understanding common symptoms of TB	39.1	30.7	34.3
Test sputum for TB	9.2	5.5	7.1
TB can be completely cured	14.1	1.5	6.9
Adherence to TB medication is important	3.1	0.0	1.3
Consequences of not treating TB	0.6	0.0	0.3
Risk of alcohol consumption and TB	4.7	3.7	4.1
Risk of tobacco consumption and TB	12.0	6.1	8.6
Stop alcohol consumption during treatment	11.0	3.8	6.9
Complete the full course of treatment	0.0	0.0	0.0
Test for TB, if one has persistent cough for more than 2 weeks	1.0	4.0	2.7
Others (specify)	5.6	4.1	4.7
Don't know/can't say	27.9	23.9	25.6
Number of cases	141	188	329

In addition to these IEC materials, the CHWs had also conducted other community engagement activities such as in-person contact meetings, sensitization meeting for key opinion leaders, and small or large group meetings to impart key knowledge on TB. We collected information about the exposure to these activities from all the respondents and the results are provided in Table 43. We have specifically analyzed the exposure of the respondents to the in-person contact meetings, participation in sensitization meetings and participation in small or large group meetings on TB. In general, the target group for sensitization meetings are key opinion leaders at the community level. Overall, close to two-thirds 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 11% percent of the respondents had attended the sensitization meeting.

Table 43: Percentage distribution by sex of adult CS persons who participated in the various types of community engagement activities in the end-line survey, Bengaluru

Exposed to	Male	Female	Total
In-person contact			
Yes	60.6	66.0	63.7
No	39.4	34.0	36.3
Sensitization meeting			
Yes	12.7	9.5	10.8
No	87.3	90.5	89.2
Small or large group meetings on TB			
Yes	38.4	34.9	36.4
No	61.6	65.1	63.6
Number of cases	187	271	458

Effect of THALI Program Exposure on Knowledge and Health Seeking

We noticed a significant increase in the knowledge aspects as well as health seeking behaviour among the adult CS persons 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 he/she is exposed to the intervention (i.e. the potential outcome in the presence of intervention), and individual “i’s” outcome if he/she 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 availability of advanced statistical techniques, one will be able to identify the effect of the program using non-experimental data. Matching methods are techniques that attempts 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 Bengaluru data alone, we pooled the data from Bengaluru with a similar study conducted in Hyderabad. We used the characteristics such as age, sex, name of the city, occupation, education, religion, marital status, caste/tribe, and household income of the respondent as the covariates in the model.

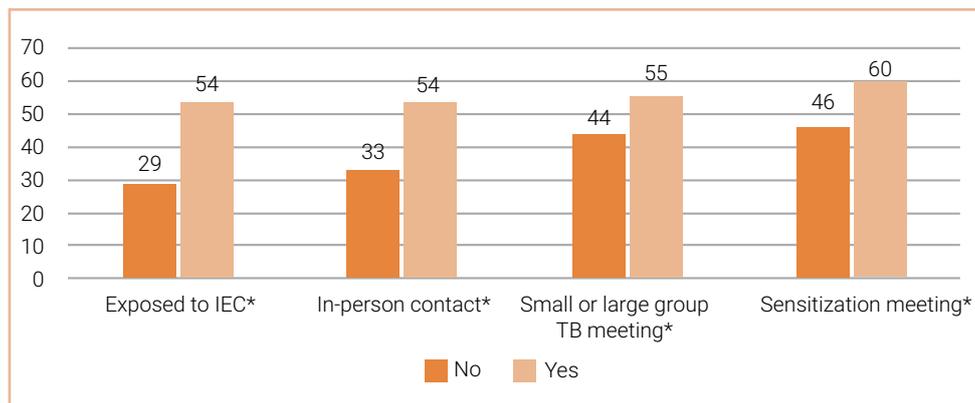
The pooled data contains the information for 869 respondents from Bengaluru and Hyderabad. We first examined the percentage of respondent according to their exposure to various THALI community engagement activities. Specifically, we examined the exposure to any of the IEC materials shown to them, in-person contacts, sensitization meetings and small or large meetings on TB from the pooled data (see Table 44). Overall, according to the pooled data, 73% of the respondents were exposed to the any of one of the IEC materials shown to them, 66% were exposed to in-person contact, 8% had participated in a sensitization meeting and 28% were attendees at a small or large meeting on TB. No differences by the sex of the respondent were noticed for the various program exposures.

Table 44: Percentage distribution of adult CS persons according to the exposure to THALI community activities in the end-line survey using the pooled data, of Bengaluru and Hyderabad

Exposed to	Male	Female	Total
Any IEC materials			
Yes	73.5	72.2	72.8
No	26.5	27.8	27.2
In-person contact			
Yes	63.4	68.1	66.1
No	36.6	31.9	33.9
Sensitization meeting			
Yes	9.3	7.4	8.3
No	90.7	92.6	91.7
Small or large meeting on TB			
Yes	29.9	26.2	27.8
No	70.1	73.8	72.2
Number of cases	379	490	869

We analyzed the difference in the comprehensive knowledge and the exposure to various community activities based on the pooled data (see Figure 3). The results indicate that the exposed group had a higher comprehensive knowledge than non-exposed group. For example, 54% of the respondents who were exposed to the IEC materials had comprehensive knowledge as compared to 26% for non-exposed group, 54% of the respondents who had in-person contact with the CHW had comprehensive knowledge as compared to 33% for their counterparts, 55% of respondents who attended small or large meetings on TB had comprehensive knowledge as compared to 44% for groups who did not attend, and 60% of the respondents who attended the sensitization meetings had comprehensive knowledge as compared to 44% who did not attend the sensitization meetings.

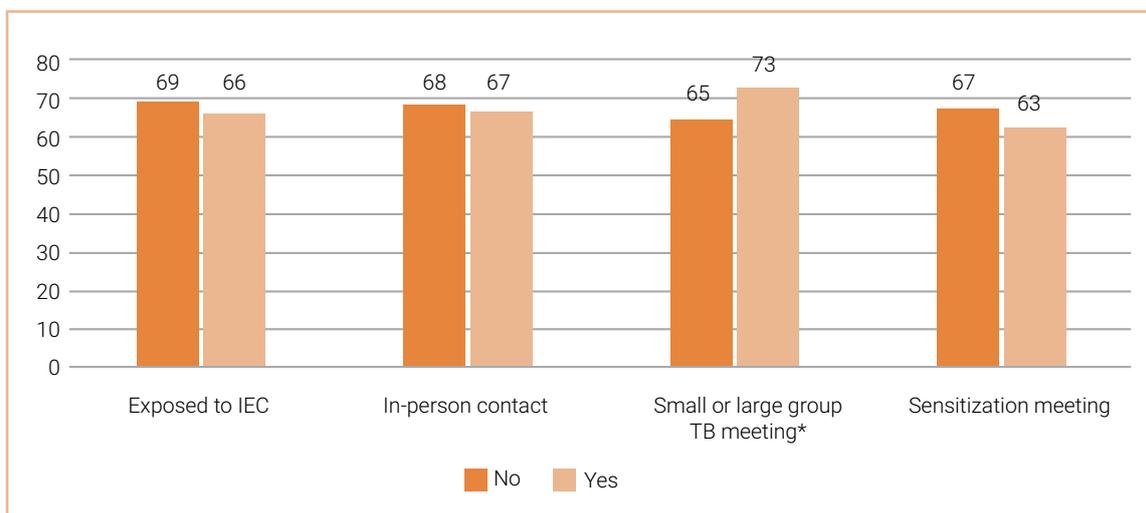
Figure 3: Percentage of CS persons who had comprehensive knowledge on TB according to exposure to specific community activity using pooled data of Bengaluru and Hyderabad



Note: * difference is significant at 5% level

The results of the pooled data on the exposure to the specific community activities and the percentage of respondents who sought treatment from a healthcare provider after two weeks of cough is shown in Figure 4. Exposure to many of the specific community-level activities did not show much difference in the proportion of respondents seeking treatment from a healthcare provider after two weeks of cough. For instance, the proportion of respondents who sought treatment from a healthcare provider after two weeks of cough was lower among respondents who were exposed to IEC material, who were exposed to in-person contact meetings and who were exposed to sensitization meetings, as compared to their counterparts who were not exposed to these activities. The maximum proportion of respondents seeking treatment from a healthcare provider after two weeks of cough were exposed to small or large meetings on TB (73%) as compared to the non-exposed group (65%).

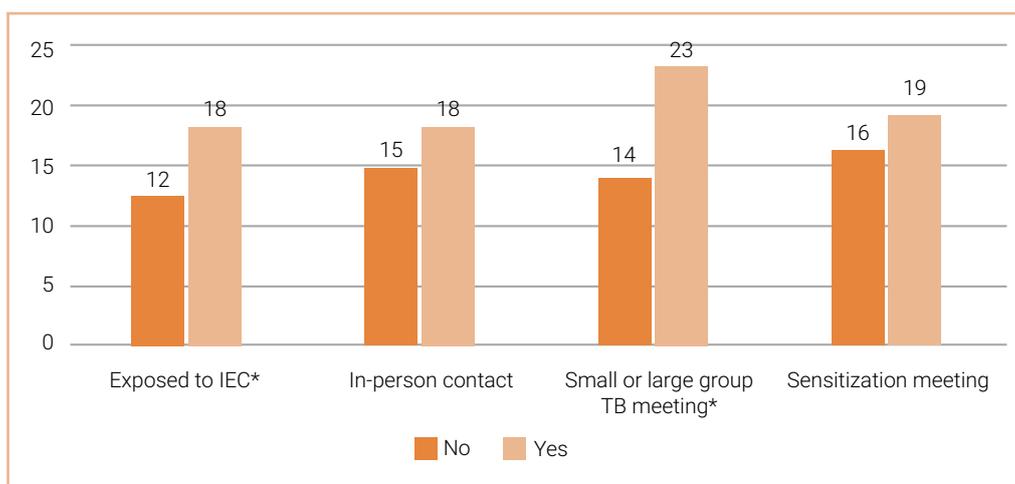
Figure 4: Percentage of CS persons who sought treatment from a healthcare provider after two weeks of cough, according to exposure to specific community activity using pooled data of Bengaluru and Hyderabad



Note: * difference is significant at 5% level

The extent to which the CS persons themselves requested for sputum tests according to the exposure to specific community activities is provided in Figure 5. We noticed that exposure to small or large group meeting on TB has the largest difference in terms of respondents themselves requesting for sputum test. Twenty-three percent of the respondents who attended the small or large group meetings on TB requested for sputum test as compared to 14% of respondents who did not attend this meeting. Although more respondents who had exposure to other activities such as IEC materials, in-person contact meetings and sensitization meetings, requested for a sputum test, the difference was small as compared to the non-exposed group.

Figure 5: Percentage of CS persons who themselves requested for a sputum test according to exposure to specific community activity using pooled data of Bengaluru and Hyderabad



Note: * difference is significant at 5% level

The results of the analysis of the effect of the specific exposure on the outcome variables, such as comprehensive knowledge, seeking treatment from a healthcare provider and requesting for a sputum test using the pooled data of Bengaluru and Hyderabad are presented in Table 45. The final model included only the variables that had achieved balancing properties based on the kernel density and box plots. Only one of the specific exposures, that is, having participated in small or large group TB meetings, had shown a significant effect on all the three outcomes studied. The results indicate that the exposure to small or large group TB meeting would have increased the comprehensive knowledge of TB by 12 percentage points, seeking treatment from healthcare provider by 10 percentage points and requesting for sputum test by 9 percentage points, as compared to the non-exposed groups. The exposure to IEC materials would have increased significantly the comprehensive knowledge by 31 percentage points and the request for sputum test by 7 percentage points as compared to non-exposed groups. We noticed that the in-person contact had an effect only on the comprehensive knowledge and exposure to in-persons contact would have increased significantly the comprehensive knowledge by 28 percentage points as compared to the non-exposed group.

Table 45: Average effect of exposure on in-person contact, IEC materials and small or large group TB meetings on comprehensive knowledge, seeking treatment from the healthcare provider and requesting for sputum tests, using pooled data of Bengaluru and Hyderabad

Average effect of exposure on	Coefficient	SE	p - value	[95% CI]	
				Lower	Upper
Comprehensive knowledge					
In-person contact	0.26	0.039	<0.001	0.18	0.34
Exposure to IEC materials	0.31	0.043	<0.001	0.22	0.39
Small or large group TB meetings	0.12	0.043	0.004	0.04	0.21
Sought treatment from healthcare provider					
In-persons contact	-0.01	0.038	0.776	-0.09	0.06
Exposure to IEC materials	-0.05	0.041	0.201	-0.13	0.03
Small or large group TB meetings	0.10	0.041	0.015	0.02	0.18

Requested for sputum test					
In-persons contact	0.01	0.032	0.814	-0.06	0.07
Exposure to IEC materials	0.07	0.033	0.026	0.01	0.14
Small or large group TB meetings	0.09	0.035	0.010	0.02	0.16

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

For exposure to in-persons contacts marital status, exposure to IEC materials, caste/tribe and small or large group TB meetings, the name of the district was not used as covariate as balancing property was not achieved for this variable.

We used sex, religion and age of the respondents as the matching variables.

Limitations of the study

We used retrospective data collection to estimate the changes in the knowledge and health seeking behavior for TB. Owing to this, there could be recall bias in providing the information on the type of healthcare provider visited at various stages after the onset of symptoms. However, since we asked for details of health seeking behavior among the person who experienced persistent cough for more than two weeks prior to the six months of survey, the recall bias may be minimal. Also, since around 40 percent of the CS persons were illiterate there could be inaccuracy in the information on the type of the healthcare provider visited, whether allopathic or qualified in other indigenous streams of medicine. Similarly, there is a chance that the interaction between the healthcare provider and the adult CS person might have influenced one's knowledge on TB and thus influenced the knowledge on TB and health seeking behavior. However, in general, the likelihood of providers imparting knowledge on TB to adult CS persons in a busy outpatient setting is very low in India. Consulting a healthcare provider may also be dependent on the duration of having or had cough. We did not collect the information on the duration of persistent cough in the study. There could also be a recall bias in informing about the exposure to the THALI program. Since, we had shown the selected IEC materials to the respondent and asked about the exposure, there was less likelihood that this aspect is underestimated. However, information on other aspects of the exposure to THALI program have to be recalled and those are likely to be underestimated. The matching method used in the report rely 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 numerous positive changes in the health seeking behavior and knowledge aspects of TB among the adult CS persons living in the urban slums in Bengaluru over the time period. We noticed that more respondents consulted a healthcare provider at an earlier stage after the onset of the symptoms. This was reflected in the reduction of the average number of days estimated from the onset of the cough to first consulting a health provider from 13 days in the baseline to 8 days in end-line. Similarly, the proportion of respondents who reported to have consulted a formal healthcare provider after two weeks of cough increased from 64% in the baseline to 70% in the end-line. There was an increase in the proportion of respondents who said that they received recommendations for diagnostic tests between the baseline and end-line surveys. However, unfortunately, this did not result in the consequent increase in the recommendations for an appropriate test for TB, such as sputum test, between baseline and end-line surveys. The proportion of respondents requesting a sputum test also increased significantly between base line and end-line surveys.

The proportion of respondents who had knowledge about TB also increased between the baseline and end-line surveys. The other key knowledge aspects of TB, such as TB is fully curable, sputum test is the confirmatory test for TB, TB spreads through air and cough is the most common symptom of TB increased between baseline and end-line surveys. Consequently, comprehensive knowledge on TB, which includes all these key knowledge aspects also increased between baseline and end-line surveys. Although there was an increase in the knowledge of various aspects of TB, we noticed an increase in the proportion of respondents who reported that the one should not disclose their TB status to the neighbors, particularly among males. We noticed a slight increase in the proportion of persons who said that the TB treatment was available for free, but still a majority of them didn't know that TB treatment was available for free.

Program implications and recommendations

The findings from the study can be used for the future implementation of programs related to TB. We identified about two-fifths of the patients to be illiterate. Any Information, Education and Communication (IEC) activities for disseminating knowledge and health seeking behavior for TB should include both visual and verbal media. We also noticed that although 72% of the CS persons were exposed to the IEC materials developed by the THALI program, 25% of them could not explain the information received through these IEC materials. Although exposure to IEC materials improved respondents' knowledge on TB, it has a limited influence on their ability to change their health seeking behavior particularly in regard to seeking treatment from a healthcare provider. It must be noted that the IEC materials were developed and supplied for the field level 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 election code of conduct was in force in the state. The IEC materials were also supposed to be used by the CHWs whenever they were making in-person contact. The respondents rarely reported to have seen IEC materials with the CHW. For example, 64% of the respondents reported that they were exposed to in-person contact, but only 9% of the respondents reported that the CHW was the source of information on the IEC materials. We identified that the group approach adopted in THALI was able to provide the stimuli that influenced people to increase their knowledge of TB and change their health seeking behaviour.

Government health facilities were not used by more than half of the households of CS persons due to issues of accessibility and quality of care. There is scope to support government health facilities in improving systems and quality standards, thereby improving health seeking at government health facilities. Presently, around 60% of the households in the slum area preferred to consult a private health facility. Government FLWs do not serve as a prominent source of information on TB. It is essential to strengthen the information source and referral mechanism at the grassroot level to make government health facilities more accessible to the urban slum population in Bengaluru.

Even though around 70% of the CS persons did visit a formal healthcare provider after two weeks of cough, many of them did not receive recommendations for the ideal test, that is, a sputum test. Recommendations for sputum testing are usually considered a function of the healthcare provider. In the absence of their recommendation, the ability of the patient to ask for a sputum test also plays a key role in the process of early detection. In our study, we noticed that there was an improvement in the proportion of respondents who requested a sputum test. However, we did not notice the same level of increment in the CS persons consulting a healthcare provider after two weeks of cough. The likelihood of undiagnosed TB will be higher, if a large number of CS persons do not seek care from a health provider. Evidence suggests that the proportion of symptomatic individuals visiting high-quality providers has the greatest attributable effect in the care cascade for TB. Even if many of the CS persons had been consulted a qualified provider, many of them were not advised sputum microscopy, particularly among for those who visited a private healthcare provider. Patient request for a sputum test may enhance provider's suspicion of TB and this could potentially reduce the delay in detection.

India's National Strategic Plan for Tuberculosis Elimination (2017-2025) prioritizes sustained, systematic screening in high-risk populations, such as individuals living in urban slums, which bear a disproportionate tuberculosis burden. Active case finding is one potential approach for reaching individuals with symptoms of TB who have not presented for care to a healthcare provider. Unfortunately, active case finding approaches are not widely implemented because of cost concerns and inadequate resources to reach and care for these populations. As such, as evident from the results, group approaches to diffuse the key knowledge aspects of TB may be important instead of individual approaches in generating demand and utilization of services related to TB. In any community, changing the value of health seeking for TB, or the degree of importance of health seeking for TB, takes a long time.

Conclusions

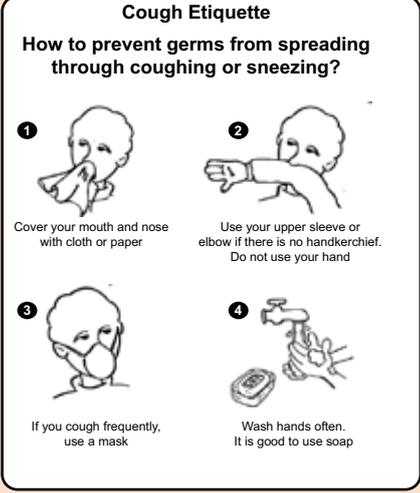
The study highlighted that community engagement activities were able to strengthen the various knowledge aspects of TB, enhance seeking treatment from a healthcare provider and requests for a sputum test. Due to various reasons, only the group-based approach adopted for the dissemination of TB-related information yielded the expected result of improving health seeking from a healthcare provider and asking for the sputum test. People exposed to IEC materials and information campaigns have increased knowledge, however, increased knowledge does not translate to behaviour change. However, group interactions and group activities tend to have a better influence on changes in health seeking behaviour. Requesting a sputum test appears to be more of a knowledge component than a behaviour-related aspect. If one has knowledge about the test, then she or he may request the healthcare provider for it, provided he or she has the confidence to do so. Evidence from the study indicated that individual confidence can be generated through a group dynamic.

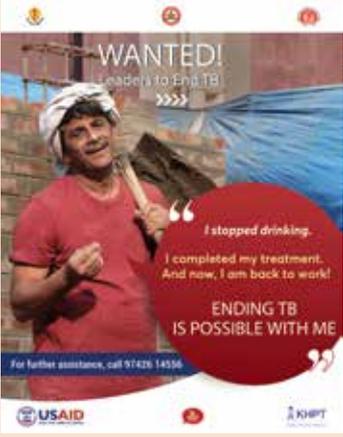
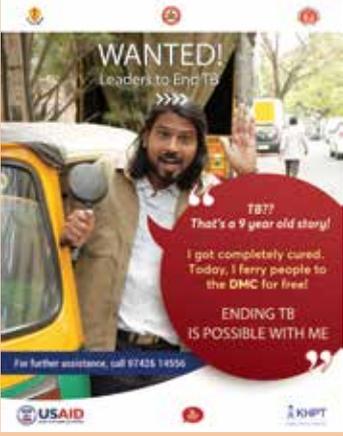
07

ANNEXURE

ANNEXURE

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

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

<p>Construction Worker-poster</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>Auto Driver-Poster</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>Pourakarmika - Poster</p>	<p>Taking individual and collective responsibility for Ending TB</p>	 <p>The poster features a woman in a brown uniform, likely a street sweeper. 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>Young Girl- Poster</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



KHPT
IT Park, 5th Floor
#1-4, Rajajinagar Industrial Area
Behind KSSIDC Administrative Office
Rajajinagar, Bengaluru - 560 044

T: +91 80 4040 0200 F: +91 80 4040 0300 W: www.khpt.org E: khptblr@khpt.org