Social Science Spectrum ISSN 2454-2806
Vol. 6, No. 1, March 2020, pp. 12-29

Exposure to Mass Media and Awareness and Correct Knowledge on Mode of Transmission of Tuberculosis in India

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Abstract

WHO estimated that 10 million people fell sick with Tuberculosis (TB) globally in the year 2019 and most of them live in Asia, and India accounts for one-fourth of the TB deaths globally. This study uses data of 6,99,686 women aged 15-49 years and 1,12,122 men aged 15-54 years from the National Family Health Survey-4, (NFHS-4) 2015-16. Eighty per cent of respondents, irrespective of gender, had reported that they ever heard of tuberculosis. Seventeen per cent of women as well as men did not report the correct mode of transmission of TB. Women and men both show almost the same pattern of exposure to mass media and it has significant effect on TB awareness, knowledge and misconception on TB. Likelihood on awareness of TB and perception of TB cure is low among radio listeners. It is clear that audio visual media has more impact on awareness generation and reduces the misconception on TB transmission. Using of 360-degree approach with social behavioural change at the community may help to promote desired behaviour. Government needs to accelerate the TB programme from clinical approach to human centric behavioural approach to provide discrimination free environment to the TB survivors.

Keywords: Tuberculosis, Awareness, Knowledge, Misconception, TB Cure, Media, India.

I. An overview

In early 1990s, global emergency was declared for Tuberculosis (TB) and it was estimated that about 70 million people were infected by the disease globally. After two decades, specific target was set for the period 2016–2035 in line with WHO's 'End TB Strategy' and the United Nations' (UN) Sustainable Development Goals (SDGs) to end the global TB epidemic. Worldwide, TB is considered one of the top ten leading causes of death and in 2019 WHO estimated that 10 million people fell sick of the disease. More than half of them were residing in five Asian countries, viz., India, Indonesia, China, the Philippines and Pakistan. India alone accounted for 26 per cent of total TB deaths globally (WHO, 2020).

To achieve the targets set in the 'End TB Strategy' which include 90 per cent reduction in TB deaths and an 80 per cent reduction in TB incidence (new cases per year) by 2030, compared with 2015, importance needs to be given to sustainable tuberculosis preventive behaviour through educational intervention and dissemination of high level of information though communication media. Results from studies conducted in different countries clearly show that TB awareness varies widely among population and it differs across socio-economic-demographic situations.

A case-control study was conducted among 90 participants randomly selected from all families which had health records in the family health centre of Ramin village in the city of Chahbahar in Iran, with intervention through a program involving a one-day workshop with three hours of group discussion and the involvement of health education, in which instructors imparted education on knowledge, attitude and behaviour (Mohammadi et al., 2012). Results show stability of knowledge,

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Acknowledgement: We would like to thank Dr. Syed Imran Farroq, Former Project Director, Challenge TB project to mentor and guide us during conceptualization of this paper.

attitude and tuberculosis preventive behaviour education after three months despite a majority of participants being illiterate or below primary level irrespective of their culture and beliefs.

A cross sectional study among 384 TB patients in Rajshahi city in Bangladesh revealed that pulmonary TB patients had greater knowledge than the extra pulmonary TB patients (Mondal et al., 2016). Age, gender (male and young adults aged 21-35 years had greater awareness on transmission and prevention of TB than females and adults over 35 years of age) and educational status (individuals with higher education and living in urban area having more knowledge on TB) are significantly associated with knowledge level. Another study by Hasan et al. (2018) assessed the knowledge, attitudes and perceptions towards TB among 400 people in Khulna city in Bangladesh. One-third of the respondents said that one might get TB from being near a patient. Other common forms of TB transmissions were through saliva, mainly due to sharing cups or drinking glass. One-fifth of the respondents said that someone could get TB from smoking and/or drinking. Multivariate analysis revealed that respondents with tertiary level of education were associated with higher TB knowledge and people having no income were associated with lower TB knowledge. Moreover, delay in seeking treatment was associated with low awareness and low recognition of the symptoms of tuberculosis.

Many studies revealed that lack of knowledge of a disease may prevent appropriate positive health care seeking behaviour. Solliman et al., (2012) conducted a cross-sectional survey among 1000 general people above 18 years of age and not having a history of TB living in five cities of North-east Libya. A majority of respondents (96%) reported that they received TB related information from television (45%), health care workers (24%) and family members (19%). More than half of the respondents answered correctly on causes of TB and 79 per cent respondents agreed that TB is a communicable disease. Respondent reported that TB could be transmitted through kissing (53%), by drinking raw milk (42%), through infected blood (38%) and through sexual relationship (21%). Statistically significant differences were noted between gender, levels of education and monthly income of the respondents. Most of the respondents were aware that TB is a highly infectious but curable disease. Knowledge is directly proportional to the level of education among the population. Several studies showed similar relationship between levels of education and TB knowledge (Lian, 1999; Portero et al., 2002; Abebe et al., 2010).

A study was carried out in 2009 by Uchenna et al., (2014) among 1200 people selected from Enugu State of South-east Nigeria to determine the knowledge, attitude and practice of tuberculosis and its socio-demographic determinants in six selected Local Government Areas (LGAs). It reveals that awareness of tuberculosis was high at 93 per cent among the households. Media played an important role as primary sources of information were radio (59%) followed by community members (30%) and television (17%). However, knowledge of TB was low, except for knowledge of TB symptoms and as expected urban residents had better knowledge of TB than the rural respondents. A majority of respondents believed that TB is curable. Socio-demographic factors are considered in subsequent behavioural changes communications in the country as educational status of individuals and their spouses and religion were significantly associated with TB-related knowledge, attitude and practice.

Mishra, Adhikari, and Khanal (2014) explored the role of mass media on knowledge generation and misconceptions about tuberculosis transmission in Nepal through a cross-sectional study among 283 respondents in the largest referral hospital. More than 80 per cent respondents correctly replied that TB transmits through air, but half of the study population replied that TB transmits through utensils, or sharing clothes/bedsheets/towel. They even reported that TB is transmitted by touching a person with TB (22%) and through sexual contact (31%). Results further confirmed that those who read newspapers and listen to radio programmes were more likely to have correct knowledge on mode of transmission of TB. Freitas et al. (2015) investigated into the knowledge and factors associated with tuberculosis among 110 relatives of several patients with tuberculosis in Ribeirão Preto, São Paulo, Brazil. Nine out of ten respondents pointed out chronic cough as a symptom. In addition, as for knowledge about transmission modes, 90 per cent

respondents pointed symptomatic respiratory mode as the probable infection source. However, they also reported sharing of clothes (79%), household utensils (60%) and sexual relations (50%) as modes of transmission. Further, education and exposure to media played an important role as illiterate relatives, those having limited exposure to television and also those who did not have the internet access were more likely to have low knowledge on TB.

Several minor studies were also conducted in India to assess awareness, knowledge and perception regarding TB transmission, myths, misconceptions and treatment. Some studies have also tried to throw light on different modes of communication along with other socio-economic and demographic factors and their impact on TB awareness and knowledge. A study among 98 TB patients registered under RNTCP in Rampurhat TU in West Bengal reported that half of them had never heard of TB before diagnosis and a majority of them perceived that chewing tobacco or smoking is the main cause of TB. One fifth of them reported that TB is transmitted through unclean water and food and sharing drinks (Pramanik & Ghosh, 2015). Earlier, Bansal et al. (2013) also found similar results during a study among TB patients at DOTs centre in urban Meerut, Uttar Pradesh. It revealed that respondents think that food and utensils are the main modes of TB transmission.

A small community-based study among 218 respondents was conducted in the urban slum at Varachha in Surat to find out knowledge about TB symptoms, spread, diagnosis, treatment and prevention (Hetvi et al, 2014). Results show that a majority of respondents are aware of TB symptoms like fever, cough for more than two weeks, weight loss, etc. Half of respondents believed that TB can be transmitted through sneezing/cough. But only half of them were also aware about correct duration of treatment. Another survey among 100 slum dwellers in Durg district of Chhattisgarh by Samal (2017) revealed that respondents knew that TB is caused by bacteria (95%), is transmissible (82%), has different modes of transmission (63%), could tell about the symptoms (63%) and were aware about its curability (76%). Another assessment using WHO (KAP) tool among 500 individuals in ten randomly selected urban slums in Mysore city revealed low knowledge about TB (46%) and there was no difference between gender but knowledge of TB increased with increasing educational level (Basavaraju & Yellappa, 2017). Family, friends and teachers remained the main sources of information on the disease whereas print media made the least impact (only 11%). Though digital media had a positive impact on the attitude and practices, the study recommended that only frequent and continuous SBCC may improve awareness.

Jangid et al., (2016) conducted a study among 510 TB patients at S.P. Medical College in Bikaner, Rajasthan to assess the source of information on TB. Results show that most of them got the information from health workers and only one-fifth knew that TB is caused by germs. Half of the patients knew the mode of spread of TB through the air when coughing, and more than 80 per cent knew that cough is the most common symptom of TB. Another study among 88 patients in Aligarh estimated that radio or television is the main source of information of TB (Eram, Nawab & Khalique, 2016). Nearly 70 per cent of respondents reported coughing as the mode of transmission but many of them also reported that it could be transmitted by sharing of common materials with a person having it.

Das et al., (2012) conducted a study among 464 patients visiting general OPD in tertiary care hospitals in West Bengal. More than 90 per cent of them had heard of TB and 82 per cent knew about its curability. However, only 16 per cent provided correct answer on the cause (infection) of the disease and 31 per cent gave correct response on the mode of its spread. Literacy status showed a significant influence on awareness about it.

Knowledge of TB is low among tribal population of India. A study among 2721 people in Saharia tribal group in central India by Muniyandi et al. (2015) shows that only half of the respondents ever heard of TB and among them only eight per cent told coughing as a symptom of the disease along with 64 per cent who mentioned coughing up blood. the study concluded that there is an important gap in education regarding TB in this tribal population.

Laxman and Torgal (2014) conducted a cross-sectional study among 400 participants to assess the knowledge and practices regarding tuberculosis among people living with HIV/AIDS at ART centre of Belgaum District Hospital. Almost one-third of respondents had poor to average knowledge on TB. The study revealed that the level of TB knowledge was significantly associated with age, gender, occupation, education and socio-economic status of the respondents without any significant impact of religion, type of family and marital status.

Sreeramareddy and Arokiasamy (2013) estimated from the National Family Health Survey-3 data that prevalence rate of self-reported tuberculosis was 445 per 1,00,000 usual household residents and almost 90 per cent respondents ever heard of TB. Further among them, 27 per cent reported not knowing about its transmission. Fifty-six per cent knew about mode of its transmission, i.e., through the air when coughing or sneezing. Nearly 30 per cent respondents reported the correct mode of transmission without any misconceptions. The survey revealed about the misconception regarding the spread of TB. That it spreads through food (32%), sharing utensils (18%) and touching a person with tuberculosis (12%) are common misconceptions about its transmission. Gender, religion and listening to radio programmes have a significant impact on correct knowledge without misconceptions. The study concludes that among the traditional mass media, the frequency of listening to radio programmes was associated with correct knowledge about tuberculosis transmission. Another cross-sectional study from rural Tamil Nadu stated that 56 per cent of respondents (out of 1985) had ever heard of TB, but 80 per cent of them were not aware of the cause and mode of its spread. Television programme was reported to be the main source of information (Kar & Logaraj, 2010).

In the given backdrop, the present study examines the awareness, knowledge and misconception about TB and perception on cure of TB in India. Further, it explores the role of socio-economic-demographic factors in exposure to communication on the awareness, knowledge and misconception and perception on its cure. This paper also brings the regional differences of awareness and knowledge on it.

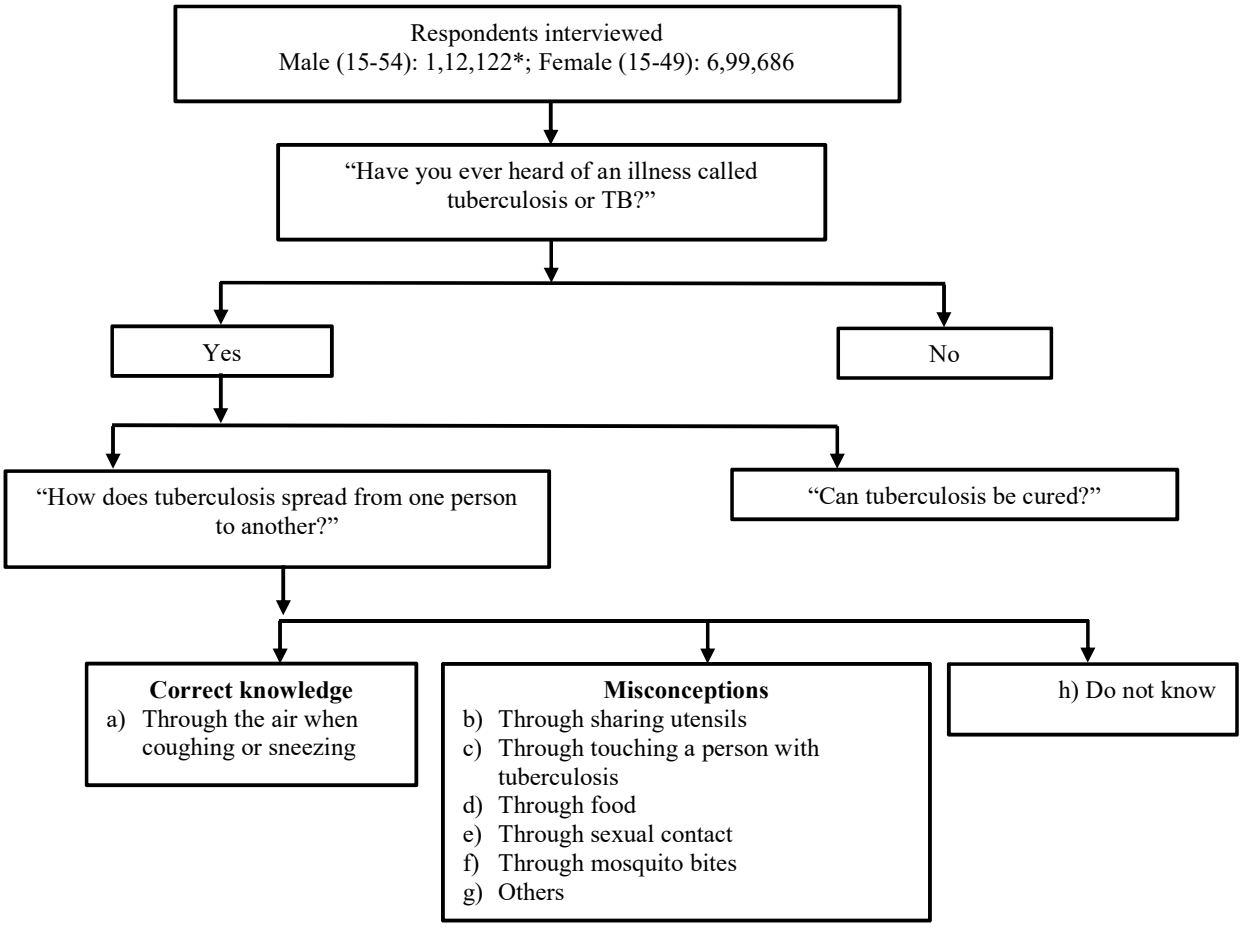
II. Methods and materials

This study uses data from the National Family Health Survey- 4 (NFHS-4) which was conducted in 2015-16 by the International Institute for Population Sciences (IIPS) and ORC Macro International. This is a part of standard Demographic and Health Survey (DHS) conducted in many countries over the decades. During the nationwide cross-sectional survey, 6,01,509 households were interviewed through household questionnaire and 6,99,686 women aged 15-49 years and 1,12,122 men aged 15-54 years were interviewed through separate questionnaires for women and men. To compare the data between both the genders, men (1,03,525) and women (6,99, 686) from the same age cohort (15-49 years) are considered for analysis in this paper.

The study analyses data on awareness, knowledge on mode of transmission of TB and also perception on its cure. To analyse these, data were retrieved from both women and men questionnaires (Figure 1). Both men and women were asked as “Have you ever heard of an illness called tuberculosis or TB?” This was a question used to estimate awareness of TB. If the response to the first question was ‘yes’, then they were asked: “How does tuberculosis spread from one person to another?” This question leads to assess knowledge on mode of transmission and further used to ascertain the correct knowledge on mode of transmission. As per Collins English Dictionary, knowledge is defined as “the fact, feelings or experiences known by a person or a group of people” (Hanks et al., 1986). This was a multiple response question with probe for more responses. Responses were categorized as: (a) Through the air when coughing or sneezing, (b) through sharing utensils, (c) through touching a person with tuberculosis, (d) through food, (e) through sexual contact, (f) through mosquito bites, (g) others, and (h) do not know. Only option (a) Through the air when coughing or sneezing is considered as the correct knowledge on mode of transmission of TB without any responses from option ‘b’ to ‘g’. Respondents who have responded as ‘Do not know’ were not included in the analysis of correct knowledge. The options from ‘b’ to ‘g’ were considered as

misconceptions. This paper also examines any misconception on TB transmission among respondents. On TB cure, respondent's perception on the curability of the disease was also assessed through a question: "can tuberculosis be cured?" This is also analysed to understand the perception of the respondents on the disease.

Figure 1: Analytical framework on awareness, knowledge on transmission and cure of TB

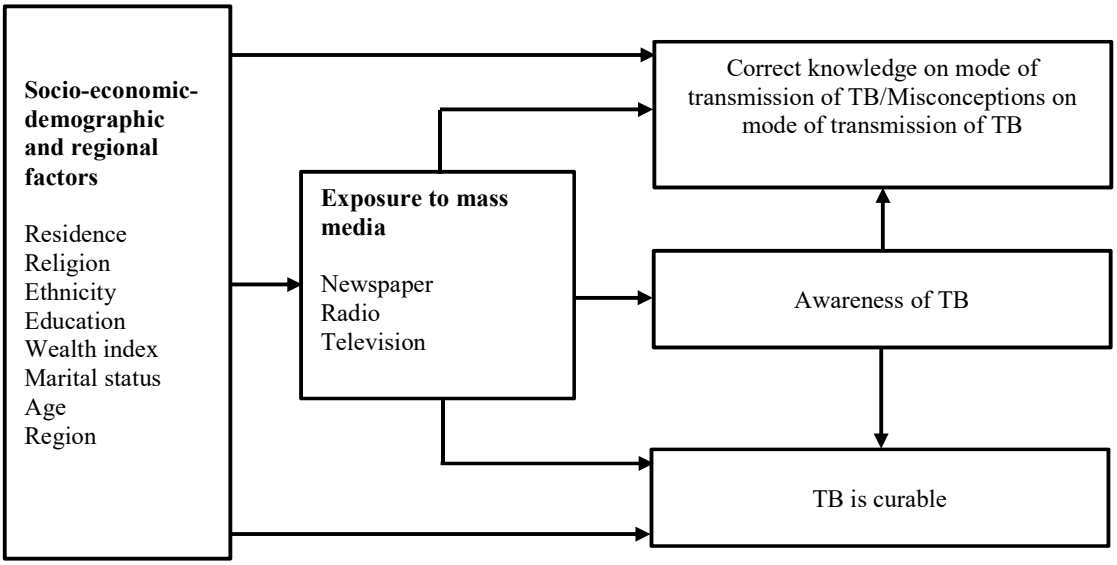


Note: * 103,525 men aged 15-49 years are considered for the analysis.

First, the awareness, knowledge on mode of transmission (correct knowledge and misconception) and perception on cure of TB are estimated for each state and also for regions in India for both genders. Regions are classified as north (Haryana, Himachal Pradesh, Jammu & Kashmir, Delhi, Punjab, Rajasthan, Uttarakhand), central (Chhattisgarh , Madhya Pradesh, Uttar Pradesh), east (Bihar, Jharkhand, Odisha, West Bengal), north-east (Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura), south (Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Telangana), West (Goa, Gujarat, Maharashtra) and union territories (Andaman & Nicobar Islands, Chandigarh, Dadra & Nagar Haveli, Daman & Diu, Lakshadweep Puducherry). Next, as revealed in several previous studies that socio-economic-demographic factors influence awareness and knowledge on TB, bivariate analyses have been carried out to understand the gross differentials on awareness, correct knowledge and misconception on mode of transmission, perception on cure of TB by selected socio-economic-demographic and regional characteristics. In addition, exposure to mass media among respondents also explored to understand its effects on awareness, correct knowledge and misconception on mode of transmission, perception on cure. However, many of these factors are interrelated to one another. A conceptual framework illustrated the relationship between independent and explanatory variables in the analysis (Figure 2). Finally, multivariate analysis, specially, binary logistic regression has been used to assess net effects of

regions as well as socio-economic-demographic factors and exposure to mass media on awareness, correct knowledge and misconception on mode of transmission, and perception on cure of TB (for details of methodology, see Retherford & Choe, 1993).

Figure 2: Conceptual framework



III. Findings

In India, there is almost no difference observed on awareness of the disease by gender (Table 1). Nearly nine in ten respondents, irrespective of sex, had reported that they ever heard of an illness called tuberculosis or TB.

Table 1: Awareness on Tuberculosis or TB by Gender, India, 2015-16

Awareness on Tuberculosis or TB	Women	Men
Ever heard of an illness called tuberculosis or TB		
Yes	87.2	87.6
No	12.8	12.4
Number of respondents	6,99,686	1,03,525

Source: Computed from NFHS-4, 2015-16 data file.

Similarly, no sex difference is observed on perception on whether tuberculosis is curable or not among who had ever heard of TB. More than 90 per cent men and 88 per cent women reported that they think TB is curable. It clearly shows that a majority of respondents ever heard of TB and also think it is a curable disease.

Table 2: Perception about Tuberculosis if it is curable by gender in India, 2015-16

Perception about Tuberculosis	Women	Men
Tuberculosis is curable		
Yes	88.7	90.6
No	6.5	5.2
Do not know	4.9	4.1
Number of respondents*	6,18,274	91,293

Source: Computed from NFHS-4, 2015-16 data file; Note: * who have had heard of Tuberculosis or TB.

While discussing on knowledge on transmission of TB among respondents, there are marginal differences on responses by gender. Estimates from the NFHS-4 data show (Table 3) that almost the same proportion of men (72%) and women (69%) reported that TB is transmitted through the air when coughing or sneezing. This is followed by through food (men: 31% and women: 37%), and through sharing utensils (men: 19% and women: 21%). Almost three per cent of respondents in both genders reported that TB is transmitted through mosquito bites, whereas almost nine per cent answered through sexual contact. However, almost an equal proportion of women and men reported that they did not know any mode of transmission of TB (13% and 16.5% respectively).

Table 3: Knowledge on modes of transmission of Tuberculosis by gender in India, 2015-16

Mode of transmission of Tuberculosis	Women	Men
Through the air when coughing or sneezing	69.2	71.8
Through sharing utensils	21.0	18.7
Through touching a person with tuberculosis	17.8	18.7
Through food	36.8	30.9
Through sexual contact	9.4	8.5
Through mosquito bites	2.7	2.9
Others	0.7	1.0
Do not know	*16.5*	*13.0*
Number of respondents*	6,18,274	91,293

Source: Computed from NFHS-4, 2015-16 data file; Note: * who have had heard of Tuberculosis or TB.

Table 3 showed the different responses received in the survey on mode of transmission of TB. However, it is important to estimate the percentage of respondents who know the correct mode of transmission of the disease, i.e., only through air when coughing or sneezing. Almost one-third of the respondents reported correct knowledge of the mode of transmission (Table 4). There is a marginal gender difference observed on correct knowledge as 33 per cent women reported the same as against 39 per cent of men. Majority of people may have the knowledge of mode of transmission of TB through air when coughing or sneezing but they also reported other misconceptions along with it, which may be translated in discriminating behaviour towards people living with TB. Data reveals that over 17 per cent of men as well as women did not report the correct mode of transmission of TB at all (Table 4). They only reported misconceptions regarding the mode of its transmission.

Table 4: Percentage of respondents having only correct knowledge and only misconceptions about transmission of Tuberculosis among who have had heard of TB by gender in India, 2015-16*

	Women	Men
Only Correct knowledge about transmission of TB[1]		
Yes	32.8	39.1
No	67.2	60.9
Number of respondents	5,05,213	78,100
Only misconceptions about transmission of TB[2]		
Yes	17.2	17.5
No	82.8	82.5
Number of respondents	5,05,213	78,100

Source: Computed from NFHS-4, 2015-16 data file.

Note: * Excluded who reported as do not know; [1] Correct knowledge defined as TB is transmitted only through the air when coughing or sneezing; [2] Misconceptions refers as TB is transmitted only through sharing utensils / through food/ touching a person with tuberculosis / sexual contact / mosquito bites / any others.

Regional diversity on awareness, knowledge and misconception of TB in India:

TB, a communicable disease, is more likely to spread faster in an over-populated country like India. The Revised National Tuberculosis Programme (RNTCP) also aims to curb the spread through increasing the awareness and breaking the chain of transmission on TB along with providing early

diagnosis and treatment. Estimates from the NFHS-4 data show clear regionalization on awareness, knowledge and misconception regarding TB in the country (Table 5a & 5b). Awareness of TB is the highest in Chandigarh among women (99%) and men (99%), whereas it is the lowest in Dadra and Nagar Haveli (59%), followed by Karnataka (63%) among women, and Daman and Diu (47%), followed by Telangana (73%) among men.

Table 5a: State-wise awareness, knowledge and misconception on Tuberculosis among women (15-49 years) in India, 2015-16

States/UTs	Ever heard of TB	No. of women	Among those who have had heard of TB				
			TB is curable	No. of women*	Mode of transmission of TB		No. of women**
					Only correct knowledge	Only mis-conceptions	
A & N Islands	85.6	2811	97.1	2467	52.2	11.3	2311
Andhra Pradesh	84.0	10428	91.1	7971	44.4	12.8	7282
Arunachal Pradesh	87.0	14294	92.1	10591	33.3	21.8	9161
Assam	89.4	28447	91.2	22549	26.1	30.1	17000
Bihar	80.9	45812	94.0	36769	22.0	27.3	30201
Chandigarh	99.2	746	99.3	721	26.7	11.2	653
Chhattisgarh	92.1	25172	95.0	21513	26.5	18.6	17720
D & N Haveli	59.1	796	88.7	414	46.9	19.1	359
Daman & Diu	85.5	1393	90.8	1067	63.4	21.3	890
Goa	96.6	1696	96.9	1560	46.3	9.2	1443
Gujarat	80.2	22932	91.1	16444	40.9	21.3	13621
Haryana	89.7	21654	97.8	19134	22.1	12.0	18136
Himachal Pradesh	93.7	9929	96.6	8648	26.6	24.1	7196
Jammu & Kashmir	89.3	23800	95.2	20453	39.2	12.5	18110
Jharkhand	88.9	29046	95.9	24436	16.1	26.3	16525
Karnataka	63.3	26291	90.9	14352	29.2	16.1	10910
Kerala	96.8	11033	91.6	9583	75.3	3.8	9378
Lakshadweep	93.1	1070	89.3	826	63.4	14.4	723
Madhya Pradesh	86.7	62803	94.2	51039	28.5	18.9	44041
Maharashtra	82.4	29460	93.0	23401	62.0	9.5	21441
Manipur	95.8	13593	93.9	11900	51.2	6.0	11019
Meghalaya	90.1	9202	95.6	7593	26.9	16.8	7324
Mizoram	94.3	12279	98.7	11241	81.0	2.8	9375
Nagaland	86.4	10790	90.2	7959	51.2	17.7	6138
Delhi	94.2	5914	97.6	5426	26.9	18.2	5052
Odisha	91.1	33721	95.8	29544	59.1	9.5	21767
Puducherry	95.3	4012	86.2	3503	50.2	13.1	3440
Punjab	97.4	19484	97.7	18693	18.4	14.4	17974
Rajasthan	92.8	41965	95.8	37401	21.8	20.5	32233
Sikkim	95.1	5293	97.8	4985	51.7	7.6	4827
Tamil Nadu	86.8	28820	80.5	22711	47.6	8.5	22132
Tripura	96.8	4804	95.4	4291	28.0	37.6	3575
Telangana	72.3	7567	91.5	4687	48.0	10.6	4258
Uttar Pradesh	95.1	97661	94.5	90629	13.4	17.5	82516
Uttarakhand	93.7	17300	96.1	15612	25.4	22.1	13240
West Bengal	93.0	17668	96.0	15636	20.4	28.4	13242
All India	87.2	699686	93.2	585749	32.8	17.2	505213

Source: Computed from NFHS-4, 2015-16 data file; Note: * Excluded respondents as they do not know that TB is curable; ** Who have heard of TB and excluded who has reported as do not know about mode of TB transmission.

Awareness is above 90 per cent in a few bigger states like Uttar Pradesh, West Bengal, Rajasthan, Odisha and Kerala, and smaller states like Goa, Sikkim and Uttarakhand and several north-eastern states among women. A similar pattern is observed among men also on awareness of TB. Almost all states show that men and women perceived that it is curable. Nearly all women responded that it is curable, whereas the highest percentage of men (99%) in Uttarakhand reported the same among all Indian states and UTs. At least eight out of ten men or women in India perceived that TB is a curable disease.

Table 5b: State-wise awareness, knowledge and misconception on Tuberculosis among men (15-49 years) in India, 2015-16

States/UTs	Ever heard of TB	No. of men	Among those who have heard of TB				
			TB is curable	No. of men*	Mode of transmission of TB		No. of men**
					Only correct knowledge	Only mis-conception	
A & N Islands	95.5	411	96.6	364	63.2	5.0	317
Andhra Pradesh	79.3	1399	93.2	1046	53.2	18.9	1011
Arunachal Pradesh	84.9	1930	97.4	1440	29.1	13.2	1339
Assam	91.8	3860	94.4	3284	32.1	23.2	2843
Bihar	85.8	5433	95.8	4590	32.9	22.0	4016
Chandigarh	99.0	120	96.9	118	22.8	7.2	115
Chhattisgarh	96.2	3529	97.5	3270	20.7	14.2	2910
D & N Haveli	60.5	206	88.7	116	66.2	21.6	104
Daman & Diu	46.9	432	84.9	251	63.7	22.6	240
Goa	92.3	767	98.3	688	36.9	0.5	673
Gujarat	85.8	5574	92.3	4350	54.5	14.6	3823
Haryana	92.7	3381	98.5	3140	20.7	16.6	3005
Himachal Pradesh	94.4	2185	98.4	1953	21.3	15.1	1593
Jammu & Kashmir	85.1	5584	97.4	4638	45.0	10.5	3806
Jharkhand	89.2	3820	96.8	3292	21.0	20.1	2585
Karnataka	64.7	3760	93.9	2059	40.8	17.4	1772
Kerala	87.8	1864	92.4	1447	84.6	7.4	1340
Lakshadweep	81.5	156	91.0	103	66.3	8.5	84
Madhya Pradesh	87.8	9496	94.9	7916	37.6	19.9	6676
Maharashtra	89.7	4455	95.8	3847	61.3	6.1	3657
Manipur	88.5	1747	96.1	1447	53.1	3.4	1379
Meghalaya	90.8	1144	98.1	979	27.3	8.6	908
Mizoram	94.4	1617	99.5	1518	75.6	8.9	1315
Nagaland	86.8	1440	92.7	1157	58.1	17.8	935
Delhi	87.3	672	95.6	591	34.0	8.7	563
Odisha	89.5	4209	94.9	3585	57.4	13.9	2945
Puducherry	88.8	610	91.2	534	58.0	14.9	520
Punjab	96.7	3027	98.2	2865	16.9	13.8	2781
Rajasthan	92.0	5892	96.9	5310	21.5	21.7	5017
Sikkim	93.3	801	96.9	746	22.1	10.1	738
Tamil Nadu	83.8	4794	83.9	3659	46.2	18.2	3614
Telangana	72.6	1054	93.2	669	41.4	23.7	623
Tripura	94.9	821	96.8	746	42.3	23.8	511
Uttar Pradesh	92.0	12939	96.0	11625	23.9	24.0	10689
Uttarakhand	96.8	1994	98.9	1902	15.3	22.9	1771
West Bengal	96.0	2402	95.8	2226	29.1	22.7	1882
All India	87.6	103525	94.6	87471	39.1	17.5	78100

Source: Computed from NFHS-4, 2015-16 data file; Note: * Excluded who has respondent as do not know about TB is curable; ** Who have heard of TB and excluded who has reported as do not know about mode of TB transmission.

Almost one-third of the respondents of both sexes reported that air (when coughing or sneezing) is a mode of transmission of TB. In addition, many of them reported misconceptions on mode of transmission of TB. When estimated the correct knowledge on mode of transmission, very few states have shown a higher correct knowledge among women. Table 5 shows more than 70 per cent women reside in states like Kerala and Mizoram having correct knowledge on mode of transmission of TB. More than half of the women from many north-eastern states and southern states also reported having correct knowledge of the same. Among men (Table 5b), correct knowledge is low in Tamil Nadu, Sikkim, Uttarakhand, Chhattisgarh, Himachal Pradesh and Karnataka (below 30%). It is also understood that correct knowledge and misconceptions on mode of transmission of TB are inversely correlated. Regional variations through gender lens also reinforced the same result.

Impact of socio-economic-demographic and regional factors on awareness and knowledge of TB

Studies revealed that awareness and knowledge on TB are associated with socio-economic and demographic factors. In addition, in India people belonging to a certain region also have an impact on their awareness and knowledge level. This is mainly due to the public health programmes which are implemented there and investment in Behaviour Change Communication (BCC) activities on TB.

Table 7 reveals that women residing in the UTs have the highest awareness of TB (94%), followed by women who live in the northern states (93%), whereas those in southern states reported the lowest level of awareness of TB (80%). Surprisingly, a marginal difference is observed with a change in place of residence among women, with over 90 per cent of them reporting that they heard of TB than their rural counterparts (86%). A similar variation is observed across religious groups and ethnicities with Hindu women and women belonging to scheduled tribes having the lowest awareness. As expected, awareness level increases with education and with moving to higher social index. Almost similar results are found among men in India on awareness of TB (Table 6a & 6b). Awareness of TB is the highest in northern region among men. Marginal differences are observed in awareness across age groups, places of residence and marital status. Rise in educational level and wealth index improves awareness among men.

Perception of TB as a curable disease is high among both the sex (Table 6a and 6b). As expected, both men and women from the southern states perceived low in terms of curability of TB compared with other regions in the country. There are marginal differences of perception across places of residence, marital status and age groups for both men and women. Even educational level and wealth index show almost no difference of perception among men.

Awareness of TB as a disease is not sufficient enough to limit the spread of the disease. Proper knowledge may help to curb the chain of transmission and hence correct knowledge on mode of transmission is an important indicator to measure. Overall, correct knowledge on mode of transmission is not high in the country. Among women in UTs, though the awareness is high on TB, correct knowledge is not so high (29%). Correct knowledge of its mode of transmission is the highest among women from Christian community, and women living in the western states in the country. On the other hand, though awareness among men in southern states is low, correct knowledge of its transmission is the second highest (highest is in the western states). A similar pattern is observed across the socio-economic-demographic and regional factors for both sexes in the country.

Further, this paper examines the misconceptions among respondents regarding mode of transmission of TB and its association with other socio-economic and demographic factors. Though many respondents reported correct mode of transmission along with misconception, but those who had reported only misconceptions on transmission of the disease are considered here. Age and marital status did not show any significant difference, but misconception decreases with a rise in educational level and wealth index. Misconceptions are the highest among Muslim men and women compared with other communities and the same is found among the scheduled tribes.

Table 6a: Awareness and knowledge on Tuberculosis among women (15-49 years) by their background characteristics, India, 2015-16

Background characteristics	Ever heard of TB	No. of women	Among who have had heard of TB				
			TB is curable	No. of women*	Mode of transmission of TB		No. of women **
					Only correct knowledge	Only mis-conceptions	
Regions							
North	92.9	134132	96.6	119941	23.0	17.2	106889
Central	92.6	185636	94.5	163181	18.2	17.9	144277
East	87.8	126247	95.3	106385	26.4	24.9	81735
North-east	90.5	98702	92.4	81109	30.9	26.	68419
West	81.8	54088	92.5	41405	55.7	13.0	36505
South	80.3	84139	87.4	59304	48.6	10.0	53960
Union Territories	93.8	16742	93.2	14424	29.3	17.5	13428
Residence							
Rural	85.5	494951	92.4	403457	30.6	19.8	339229
Urban	90.3	204735	94.6	182292	36.3	12.9	165984
Religions							
Hindu	86.9	519281	93.0	433965	32.7	17.0	373227
Muslim	87.7	94591	93.7	79340	30.6	19.7	67985
Christian	88.6	52113	92.2	42894	49.3	11.0	37264
Others	91.7	33701	96.7	29550	31.6	14.7	26737
Ethnicity							
Scheduled caste	87.0	124813	92.6	104320	30.9	18.4	90015
Scheduled tribe	79.7	127133	91.7	98355	35.9	20.4	79783
Other backward classes	87.4	273700	92.6	231502	32.5	16.6	200835
Others	89.5	174040	95.1	151572	33.9	16.4	134580
Years of schooling							
No schooling	79.5	197568	91.1	147195	27.7	25.4	114350
< 5	83.5	39926	91.7	31153	32.8	23.9	24567
5-11	89.1	321202	93.2	275823	34.4	16.5	240789
12 +	94.1	140990	95.7	131578	34.5	10.0	125507
Wealth index							
Poorest	80.8	133249	91.3	98824	24.7	27.2	74464
Poorer	84.8	149466	91.9	120099	28.8	22.8	98703
Middle	86.1	147168	92.4	123303	33.7	17.3	106917
Richer	89.3	138502	93.6	121673	37.0	13.8	110069
Richest	93.7	131301	95.9	121850	35.7	10.5	115060
Marital status							
Never married	89.8	169814	93.4	146601	32.0	14.8	131779
Ever married	86.4	529872	93.2	439148	33.1	17.9	373434
Age groups (in years)							
15-19	88.1	124878	92.5	104719	31.0	17.2	92138
20-24	88.5	122955	93.8	104790	32.1	15.9	92011
25-29	87.1	115076	93.7	96874	33.5	16.6	83890
30-34	87.3	97048	93.6	81573	33.4	17.3	69976
35-39	86.8	90433	92.9	75368	33.1	17.8	64586
40 +	85.6	149296	92.9	122425	33.9	18.3	102612
No. of respondents	87.2	699686	93.2	585749	32.8	17.2	505213

Source: Computed from NFHS-4, 2015-16; Note: Total number may not add up to total sample size due to do not know and missing cases; * Excluded who has respondent as do not know about TB is curable; ** Who have had heard of TB and excluded who has reported as they do not know about mode of TB transmission; # Included who never attended school and cannot read at all/blind/visually impaired.

Table 6b: Awareness and knowledge of Tuberculosis among men aged 15-49 years by background characteristics, India, 2015-16

Background characteristics	Ever heard of TB	No. of men	Among those who had heard of TB				
			TB is curable	Number of men *	Mode of transmission of TB		No. of men **
					Only correct knowledge	Only mis-conceptions	
Regions							
North	92.6	22063	97.7	19808	22.4	17.7	17973
Central	91.3	25964	95.9	22811	27.1	21.9	20275
East	90.7	15864	95.8	13693	33.7	20.9	11428
North-East	91.7	13360	95.2	11317	35.4	20.5	9968
West	88.1	10796	94.4	8885	58.1	9.4	8153
South	78.0	12871	89.7	8880	51.5	17.3	8360
Union Territories	86.6	2607	95.2	2077	36.2	9.3	1943
Residence							
Rural	86.5	70754	94.3	59015	37.1	20.1	51926
Urban	89.3	32771	94.9	28456	42.0	13.6	26174
Religions							
Hindu	87.6	77115	94.5	65216	39.3	17.1	58441
Muslim	86.5	14437	94.5	11977	38.1	18.1	10337
Christian	85.9	7026	92.7	5869	52.4	13.0	5270
Others	93.6	4947	96.9	4409	29.6	13.3	4052
Ethnicity							
Scheduled Castes	87.8	18479	94.2	15683	35.7	20.0	14150
Scheduled Tribes	82.7	18404	94.0	14859	40.5	19.7	12661
Other backward classes	86.9	40181	93.9	34025	39.1	18.4	30622
Others	90.1	26461	96.0	22904	40.9	13.7	20667
Years of schooling							
No schooling	78.3	12777	92.5	9473	35.0	26.6	7776
< 5	84.4	6109	92.5	4808	37.8	24.5	3948
5-11	87.7	55865	94.1	47097	39.4	18.0	41637
12 +	91.8	28774	96.3	26093	40.0	12.9	24739
Wealth index							
Poorest	83.5	17035	93.5	13292	32.0	26.6	10998
Poorer	85.8	21584	94.1	17643	36.6	21.2	15171
Middle	86.3	22604	94.1	19049	40.3	17.7	17051
Richer	88.0	21516	94.6	18584	41.3	15.6	17079
Richest	92.3	20786	95.8	18903	41.4	11.9	17801
Marital status							
Never married	86.7	39869	94.3	33100	39.0	16.6	29710
Ever married	88.1	63656	94.7	54371	39.1	18.0	48390
Age groups (in years)							
15-19	84.1	19082	93.2	15272	39.1	18.8	13547
20-24	89.2	16630	95.0	14174	38.5	16.1	12717
25-29	88.2	16151	95.3	13844	38.1	16.8	12436
30-34	88.6	14640	94.7	12587	40.5	16.9	11189
35-39	88.7	13897	95.0	11892	40.1	17.8	10634
40 +	87.4	23125	94.4	19702	38.7	18.1	17577
No. of respondents	87.6	103525	94.6	87471	39.1	17.5	78100

Source: Computed from NFHS-4, 2015-16; Note: Total number may not add up to total sample size due to do not know and missing cases; * Excluded those respondents as do not know TB is curable; ** Who have heard of TB and excluded those reported that they do not know about the mode of TB transmission.

Effect of exposure to mass media on awareness, knowledge and misconception on TB

Mass media plays an important role to disseminate information to the people to motivate behaviour change. Social behaviour change communication is completely dependent upon these channels of communication and this helps to reach maximum number of people at a certain time point. Mass media is commonly composed of newspapers, radio, television and cinema. In recent years, social media such as face book, twitter, etc., also provide information on different issues and are used to disseminate information from the government.

Table 7 shows the results of exposure to mass media on awareness, knowledge and misconceptions on mode of TB among men and women. Women and men both show almost same pattern between different level of exposure of mass media and awareness, knowledge and misconception on TB. There is a difference among those who do not read newspapers from others who read it on awareness level and as well for misconceptions. Awareness on TB is the lowest and misconception is the highest among those who do not read the newspaper at all. The perception of TB as a curable disease does not vary with the newspaper reading among respondents.

Radio communication is an important medium to reach the media's dark areas in the county as this target to the low-income group population and also provides information to illiterate people. However, it did not show any significant variation on awareness, knowledge and misconception with different frequencies of listening to it. NFHS-4 estimates that 8.1 per cent of households own radio in the survey. This reveals that the popularity of listening to radio communication may have reduced or the effect may not have the expected impact on the listeners.

Television is an audio-visual medium to create greater impact on the mind of the viewer. Among women, there are marginal differences observed in awareness with increase in frequency of viewing it. However, a large difference is observed on misconception of mode of transmission and TV watching. People who do not watch it at all have misconception on the mode of transmission of the disease. It is important to note that watching TV programmes may reduce the misconception.

Cinema is considered an important medium to communicate with the population as there is a captive audience in the theatre and the reach of the message is almost 100 per cent. However, the data reveals that watching a movie has a marginal effect on TB awareness, knowledge and misconception. It may also be pointed out that this medium of communication may not be utilized completely to reach the target population. A study on the impact of TB-related messages through a short film among 54 women associated with self-help groups in Chennai shows that an audio-visual medium like a short film may play a vital role in creating tuberculosis awareness (Makesh, 2011).

Till now we have discussed the gross differentials which examine a socio-economic-demographic and regional explanatory factors at a time for awareness, knowledge and misconception of TB. However, many of these factors may be interrelated, e.g., level of education is associated with caste, religion, place of residence wealth index, age, etc. Hence, to examine the net effect of an individual factor, a multivariate analysis was carried out employing the logistic regression analysis technique since all dependent variables are dichotomous.

Results show that explanatory factors have a significant impact on awareness of knowledge on mode of transmission of TB among men and women. This also reveals the same pattern for both sexes. It clearly shows that likelihood of awareness on TB is significantly low among women living in western states in the country. The same pattern is also observed among men, though respondents living in the Union Territories show the lowest likelihood. As expected, urban respondents are more likely to have awareness of TB and also as TB is curable but surprisingly correct knowledge on mode of transmission of TB is less likely among them than their rural counterparts. Among women, likelihood for awareness of perception of TB cure and correct knowledge increases and decreases misconception with an increase in education level and wealth index for the same. However, likelihood of correct knowledge on TB transmission is low among men with primary level of

education than men with no schooling. Men with primary level of education are less likely to have correct knowledge of mode of transmission than men with no schooling. This clearly indicates that only higher education is important to remove misconception of mode of transmission of TB or to have correct knowledge.

Table 7: Awareness and knowledge of tuberculosis among women and men aged 15-49 years by media exposure, India, 2015-16

Background characteristics	Ever heard of TB	No. of respon-dents	Among who have heard of TB				
			TB is curable	No. of respon-dents*	Mode of transmission of TB		No. of respon-dents **
					Only correct knowledge	Only mis-conceptions	
Women							
Read a newspaper or magazine							
Not at all[#]	83.8	427417	91.9	338347	31.1	21.6	275176
Less than once a week	92.6	102276	93.9	92249	31.2	15.2	83533
At least once a week	91.2	86196	95.1	77911	34.5	12.9	72557
Almost every day	92.4	83797	95.8	77242	38.1	8.8	73947
Listen to the radio programme							
Not at all	87.2	585631	93.1	487781	32.7	17.7	416563
Less than once a week	90.5	41394	94.0	36187	30.4	15.6	32623
At least once a week	84.2	43668	93.5	36507	34.3	15.3	32859
Almost every day	87.4	28993	93.8	25274	36.0	11.7	23168
Watch television programme							
Not at all	80.5	170542	91.6	127516	25.3	25.0	99220
Less than once a week	88.4	52768	93.0	43924	25.2	22.9	36265
At least once a week	86.7	81777	93.3	68423	30.5	20.3	58017
Almost every day	89.6	394599	93.7	345886	36.0	14.0	311711
Usually go to a cinema hall or theatre to see a movie at least once a month							
No	87.0	655952	93.1	547202	32.5	17.7	469013
Yes	89.3	43734	94.4	38547	36.1	12.3	36200
No. of respondents	87.2	699686	93.2	585749	32.8	17.2	505213
Men							
Read a newspaper or magazine							
Not at all[#]	81.6	34548	92.6	26565	37.0	23.7	22131
Less than once a week	90.9	16659	94.7	14526	35.2	17.8	12844
At least once a week	89.6	22648	95.2	19875	38.5	16.4	18046
Almost every day	90.3	29670	95.8	26505	42.4	13.7	25079
Listen to the radio programme							
Not at all	88.3	73009	94.7	61946	39.0	17.4	54892
Less than once a week	89.6	9894	95.5	8562	33.5	17.8	7747
At least once a week	85.2	13119	94.3	10861	42.3	17.5	9879
Almost every day	82.7	7503	92.4	6102	40.9	17.5	5582
Watch television programme							
Not at all	81.0	15150	93.2	11452	34.8	24.7	9545
Less than once a week	89.4	10858	94.8	9223	31.5	22.5	7872
At least once a week	87.9	17505	94.2	14804	37.9	19.1	13032
Almost every day	88.6	60012	94.7	51992	41.1	15.2	47651
Usually go to a cinema hall or theatre to see a movie at least once a month							
No	87.8	86486	94.7	73126	37.8	18.4	64724
Yes	86.7	17038	94.2	14345	43.2	14.4	13376
No. of respondents	87.6	103525	94.6	87471	39.1	17.5	78100

Source: Computed from NFHS-4, 2015-16; Note: Total number may not add up to total sample size due to do not know and missing case; * Excluded who has respondent as do not know about TB is curable; ** Who had heard of TB and excluded who has reported as do not know about mode of TB transmission; [#] Included who never attended school and cannot read at all/blind/ visually impaired.

Table 8: Logistic regression results (Odds Ratio) of awareness and knowledge on Tuberculosis among women and men aged 15-49 years by background characteristics, India, 2015-16

Background characteristics	Women				Men			
	Ever heard of TB	Among who had heard of TB			Ever heard of TB	Among who had heard of TB		
		TB is curable	Mode of transmission of TB			TB is curable	Mode of transmission of TB	
			Only correct knowledge	Only mis-conceptions			Only correct knowledge	Only mis-conceptions
Regions								
South (RC)								
North	4.550	4.977	.317	1.669	4.245	5.919	.265	.978
Central	6.360	4.158	.242	1.445	4.861	3.922	.345	1.058
East	4.096	5.162	.388	2.067	5.084	3.894	.469	.970
North-east	4.331	2.622	.440	2.610	5.542	3.295	.483	1.027
West	1.324	1.928	1.325	1.256	2.380	2.121	1.270	.484
Union Territories	3.079	3.792	.434	2.143	1.874	2.628	.526	.524
Residence								
Rural (RC)								
Urban	1.115	1.162	.997	.919	1.126	1.058	.986	.865
Religions								
Hindu (RC)								
Muslim	1.032	1.045	.973	1.053	.873	.941	1.011	.999
Christian	1.370	1.199	1.341	.726	1.112	.983	1.282	.727
Others	1.180	1.409	.941	.915	1.330	1.192	.791	.826
Ethnicity								
Others (RC)								
Scheduled castes	1.137	.912	.930	.960	1.082	.811	.911	1.217
Scheduled tribes	.803	.890	1.129	.930	.778	.829	1.061	1.106
Other backward classes	1.082	.892	.960	.954	1.015	.808	.933	1.178
Years of schooling								
No schooling (RC)								
< 5 years	1.342	1.072	1.003	.948	1.263	.917	.973	1.057
5-11 years	1.833	1.235	1.129	.725	1.346	1.014	1.070	.834
12 + years	3.069	1.644	1.049	.538	1.726	1.422	1.026	.683
Wealth index								
Poorest (RC)								
Poorer	1.269	1.163	.979	.938	1.189	1.193	1.039	.902
Middle	1.394	1.373	.993	.814	1.311	1.256	1.079	.839
Richer	1.616	1.509	1.049	.747	1.439	1.297	1.058	.832
Richest	2.031	1.708	1.053	.664	1.831	1.207	1.131	.736
Marital status								
Never married (RC)								
Ever married	.959	1.092	.962	1.088	1.117	1.033	1.060	1.045
Age groups (in years)								
15-19 (RC)								
20-24	1.120	1.179	1.027	.934	1.502	1.289	.932	.883
25-29	1.205	1.286	1.055	.903	1.432	1.491	.867	.873
30-34	1.382	1.328	1.040	.888	1.592	1.422	.917	.844
35-39	1.496	1.298	.992	.886	1.685	1.535	.905	.866
40 +	1.469	1.329	1.039	.882	1.615	1.475	.835	.862
Read a newspaper or magazine								
Not at all[#] (RC)								
Less than once a week	1.535	1.199	.834	.930	1.756	1.278	.894	.845
At least once a week	1.282	1.465	.894	.865	1.652	1.526	.982	.808
Almost every day	1.288	1.632	.962	.720	1.801	1.859	1.033	.790
Listen to the radio programme								
Not at all (RC)								
Less than once a week	.935	.974	.925	.951	.926	1.123	.836	1.018
At least once a week	.585	.877	1.003	.999	.681	.904	1.055	1.105
Almost every day	.744	.961	.984	.857	.581	.672	.914	1.183

Table 8: Logistic regression results (Odds Ratio) of awareness and knowledge on Tuberculosis among women and men aged 15-49 years by background characteristics, India, 2015-16…. *(continued)*

Background characteristics	Women				Men			
	Ever heard of TB	Among who had heard of TB			Ever heard of TB	Among who had heard of TB		
		TB is curable	Mode of transmission of TB			TB is curable	Mode of transmission of TB	
			Only correct knowledge	Only mis-conceptions			Only correct knowledge	Only mis-conceptions
Watch television								
Not at all (RC)								
Less than once a week	1.618	1.154	.938	1.056	1.637	1.080	.860	1.003
At least once a week	1.462	1.169	1.074	1.005	1.525	.968	1.016	.905
Almost every day	1.918	1.344	1.083	.906	1.803	1.205	.909	.870
Usually go to a cinema hall or theatre to see a movie at least once a month								
No (RC)								
Yes	.961	1.168	.817	1.148	1.100	1.180	.904	.934
Constant	*.577*	*1.793*	*.896*	*.274*	*.467*	*2.944*	*1.226*	*.453*
-2loglikelihood	*4.79*	*2.70*	*5.96*	*4.45*	*7.06*	*3.46*	*9.91*	*7.09*
Nagelkarke R^2	*.146*	*.075*	*.126*	*.071*	*0.12*	*0.66*	*0.10*	*0.05*
No. of respondents	*699686*	*585749*	*505213*	*505213*	*103525*	*87471*	*78100*	*78100*

Note**:** RC**:** Reference category**;** NA: Not applicable. Odd ratios in all categories are significant at 0.001% level.

Media exposure has a significant effect on TB awareness, knowledge and misconception on transmission. Likelihood of awareness of TB is low among male radio programme listeners. The same result is observed for perception of TB cure. Among women, a similar pattern is also observed. It is clear that audio visual media has more impact on awareness generation and reduces the misconception of TB transmission.

IV. Discussion and conclusion

Though awareness of TB is high irrespective of gender in India, so also the misconceptions on mode of its transmission. Almost one out of five respondents in either gender reported misconceptions on its transmission. However, it is a curable disease and nine out of ten respondents agreed with it. In addition, it is an airborne disease and a majority of them said that (more than one third irrespective of gender). But many of them also mentioned misconceptions on other modes of its transmission.

Mass media played an important role in awareness of its transmission. People with higher exposure are less likely to have misconception. In India, mass media constitutes a lion's share to disseminate awareness and knowledge to the people through different campaigns at national and sub-national levels. Exposure to mass media is considered to be the highest and strategic use of all forms of mass media provides maximum reach to the people. Therefore, the Government of India took the initiative to engage mass media to disseminate awareness and knowledge on the mode of its transmission as well as for diagnostics.

Awareness of a disease is not enough but its correct knowledge including the mode of its transmission may help to prevent its spread. Revised National Tuberculosis Control Programme (RNTCP) in India worked towards a TB-free India by 2015. This is also in line with WHO's 'End TB Strategy'. The Government of India should take steps to eradicate TB to provide healthy life to all citizens. Call to 'Action for TB-Free India' was launched in 2016 and it helped to realise that it is a silent killer. This has increased the budget provision for TB. The Prime Minister of India took TB problem in international forum to discuss how to STOP TB in partnership with different pharma companies. All these helped to lower the transmission and also generated awareness among the people.

National Strategic Plan with the goal to achieve SDG End-TB-Strategy targets by 2025 is implemented by the Ministry of Health and Family Welfare (MoHFW) with a multi-sectoral response to address the social determinants like nutritional support, living and working conditions and an increase in access to diagnostic and treatment services. While the community level intervention is focused on the Government programme, use of different media like mid-media and inter-personal communication also provides 360-degree approach to the community to provide an enabling environment to the TB survivors. Partnership with different radio and TV channels also helped to increase the visibility and disseminate the message on the correct mode of its transmission. As visible from the findings that exposure to audio-visual media is more powerful than print media, and Government of India also emphases through different TV campaign and radio programme to promote awareness and also active case finding drive like *'bulgam bhai'* etc. Media dark areas are the concern for the Government as reach through IPC is the only solution and which is dependent on human resources and skill of counsellors and community health workers. A public-private partnership with different corporate bodies may provide the solution.

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