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Original Article

Assessing second-hand smoke exposure among non-smoking youth in India: Insights from GATS I & II

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***Background & objectives*: This study aimed to compare the prevalence and identify the patterns of second-hand smoke (SHS) exposure among non-smoking Indian youth (ages 15-24 and 25-29 yr) in various settings-homes, workplaces, public places, and a combination of these locations-based on sociodemographic factors and knowledge about the health implications of smoking. The purpose of the study was to identify the factors influencing SHS exposure in India between the Global Adult Tobacco Survey (GATS) I and II.**

***Methods*: Secondary data analysis was conducted utilising GATS I and II data to analyse the prevalence and patterns of SHS exposure at home, workplace, public place and all the places combined among non-smoking youths aged 15-29 yr. The study sample included 20,604 and 20,927 individuals for GATS I and II, respectively. The predictor variables included the socio demographic variables and the knowledge regarding the ill effects of smoking. Weighted prevalence was calculated using survey weights, and multivariate logistic regression analyses were utilised to examine the adjusted relationships between SHS exposure and predictors.**

***Results*: Between GATS I and II, there was a notable decline in the weighted prevalence of SHS exposure at home and in public places among non-smoking youth aged 15-29 yr. The study also indicates an increase in workplace SHS exposure between the two rounds of GATS among non-smoking youth who had knowledge about the ill effects of SHS exposure on health. Multivariate regression analyses revealed significant associations between SHS exposure and gender, education level, employment status, place of residence, and wealth index, affecting exposure in one or more locations.**

***Interpretation & conclusions*: Our secondary analysis of GATS data from 2009-10 to 2016-17 reveals a decline in SHS exposure at home and public places but an increase in workplaces among non-smoking youth. Factors like female gender, higher education, and wealth were linked to lower SHS exposure, while rural residence and self-employment indicated higher risks. These findings underscore the need for targeted, community-based interventions and stricter enforcement of anti-tobacco laws to protect non-smoking youth in India.**

Key words Non-smoking youth - pattern - policies - prevalence - second-hand smoking - workplace exposure

Youths represent a country's future and serve as the primary drivers of change and progress in any

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nation. India is home to one-fifth of the global youth population[1]. Evidence suggests an increase in tobacco use among youths. More than eight million deaths are caused globally by tobacco consumption in any form - smoked, smokeless, and second-hand smoke (SHS) exposure, with ~15 per cent of the adult population consuming tobacco daily[2,3]. In India, ~28.6 per cent of adults use tobacco[4], while a little over one-third of the non-smokers are exposed to SHS[5]. The Global Youth Tobacco Survey-4 (2019)[6] reported that 8.5 per cent of adolescents aged 13-15 used tobacco, while 12 per cent faced SHS exposure at home, 22.2 per cent in enclosed public places, and 28.5 per cent in outdoor areas in the last seven days[6]. While tobacco use remains a significant health concern[7], an even greater concern is prolonged SHS exposure, which is as damaging as chronic active smoking[8]. SHS is a mix of smoke exhaled by smokers and smoke from burning tobacco products like cigarettes, *bidis*, and water pipes. It contains hundreds of toxins and causes health effects similar to those of active smoking[9]. SHS exposure contributes significantly to morbidity and mortality, causing around 1.2 million premature deaths globally, and is a major risk factor for respiratory ailments, lung cancer, and cardiovascular complications[10-12]. Along with physical health problems, SHS exposure impacts psychological health, affecting behavior, sleep, and mood, and is linked to anxiety, agitation, and depression in both youths and adults[13].

Indoor spaces, including homes, workplaces, public transport, and locations such as parks, eateries, and restaurants, are common sites for SHS exposure[14]. A significant number of non-smokers, particularly women and children, are exposed to SHS at home[15]. The Global Adult Tobacco Survey (GATS) II[5] reports that 30 per cent of adults in India face SHS exposure at work and 23 per cent in public places.

The workplace remains a substantial source of SHS exposure[16]. Working adults spend a major portion of their time at the workplace, making it a primary source of SHS exposure for non-smokers[17]. In a German study[18], over 40 per cent of non-smokers reported being exposed to SHS at work. Also, both GATS I and GATS II showed five times higher odds of SHS exposure at home and three times higher odds at the workplace among non-smoking youths aged 15-24 yr[19]. In Bangladesh, China, and Egypt, over 60 per cent of adults working indoors have been exposed to SHS at their workplace[20].

The World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) mandates smoke-free environments to protect non-smokers, especially minors, from SHS globally. In 2004, India enacted the Cigarettes and Other Tobacco Products Act (COTPA) to curb tobacco use and SHS exposure[21]. However, several anomalies in the COTPA are consequent with no major reduction in the tobacco use prevalence or SHS exposure largely due to failure to comply with the Act's requirements, indicating potential gaps in the effectiveness of its enforcement. Strengthening COTPA compliance and evaluating its implementation are vital to advancing tobacco regulation and reducing SHS exposure. The Government of India struggles with unclear administrative guidelines, leading to inconsistent enforcement due to State-level implementation variations. Additionally, limited research on SHS exposure among non-smoking youth (15-29 yr) highlights gaps in understanding its prevalence and effects. Early SHS exposure and tobacco use initiation increase the risk of asthma and reduce lung function, even in adolescence[22]. Under the given background, the study examines SHS exposure among non-smoking youth (ages 15-24 and 25-29 yr) across settings-homes, workplaces, public areas, and combinations thereof. It also explores the influence of socio demographics and health risk awareness on SHS exposure and identifies factors driving changes between GATS I and II in India. In this study, the selected age groups (15-24; 25-29 yr) encompass both school-going adolescents, who may be at risk of SHS exposure, particularly at home due to parental or family tobacco use, and college-going adolescents and young adults transitioning into professional life. GATS II reports that exposure to SHS is highest in the 15-24 yr age group (27.1%), followed by the 25-44 yr age group (26.8%)[23]. The two age groups display unique characteristics, resulting in varying levels and patterns of SHS exposure. They are categorised separately to reflect the distinct exposure dynamics during critical life stages: adolescence, often associated with the initiation of tobacco use, and early adulthood, where exposure patterns may differ.

Materials & Methods

The study was conducted at Health Related Information Dissemination Amongst Youth (HRIDAY), New Delhi, in collaboration with the Department of Health Promotion, Public Health Foundation of India, New Delhi, and the School of Health Systems

Studies, Tata Institute of Social Sciences, Mumbai, Maharashtra, India.

Data source: GATS is a cross-sectional, nationally representative household survey covering all the States of India. GATS is undertaken to measure and monitor the prevalence of tobacco use, exposure to SHS, as well as the impact of tobacco control measures across several sociodemographic variables. The first and second rounds of GATS were carried out in 2009-10 and 2016-17, respectively. Detailed descriptions of the methodology followed in implementing GATS I and II have been published elsewhere[23,24].

Analytical sample: A total of 12,523 (15-24 yr) and 8,081 (25-29 yr) non-smoking youths from GATS I and 12,668 (15-24 yr) and 8,259 (25-29 yr) non-smoking youths from GATS II formed the analytical sample of this study. All participants included in the analytical sample were individuals living in their usual homes at the time of the survey.

Outcome variables: SHS exposure at home, workplace, public places, and all three places were the outcome variables in this study. The following items of the questionnaire assessed the exposure to SHS:

(*i*) How often does anyone smoke inside your home?
(*ii*) During the past 30 days, did anyone smoke in indoor areas where you work?

Exposure to SHS in public places was assessed for non-smoking youths who reported people smoking in public places (restaurants, eateries, nightclubs, cinema halls, government buildings, private offices) in the past 30 days at least once and a combination of exposure to SHS at all three places (home, workplace, and any public place) was computed by estimating the number of non-smokers exposed to SHS at home, workplace, and any public places in the last 30 days prior to the survey.

Explanatory variables: The respondents' age (15-24 yr, 25-29 yr), gender (male, female), level of education (no formal education, less than primary, primary but less than secondary, secondary, and above), employment status (government/private employee, self-employed, student, unemployed), place of residence (urban, rural), and wealth index (poor, middle, rich) were used as the predictors of exposure to SHS. In addition, the information on respondents' knowledge of smoking causing health hazards such as stroke, heart attack, and lung cancer and knowledge that SHS exposure causes serious illness in adults and children were also utilised.

Data analysis: The significance of the change in the prevalence between the two samples (GATS I and II) was tested using the test for proportion since the samples from GATS I and II were cross-sectional in nature. Additionally, multivariate logistic regression analyses were employed to examine the adjusted relationship between SHS exposure at three places separately, as well as together with socio demographic characteristics and knowledge-related parameters on the harmful effects of tobacco. Each outcome was modelled relative to the non-exposure to SHS at different places to report the adjusted prevalence ratios. Separate models were run for each SHS exposure setting (home, workplace, public places, and all three combined) for GATS I and II. The models included gender, education, employment status, place of residence, wealth index, and knowledge variables as covariates. The analysis was conducted using the `svy` commands in Stata version 13 (StataCorp 2013, Texas, USA). All the analyses were appropriately weighted and adjusted for the complex GATS I and II survey design. A P value <0.05 was considered significant.

Results

For estimating non-smoking youths who were exposed to SHS exposure at home, all 12,523 (15-24 yr), 8,081 (25-29 yr) from GATS I and 12,668 (15-24 yr), 8,259 (25-29 yr) from GATS II were included. For estimating SHS exposure prevalence at their places of work (both indoor and outdoor), 1,779 (15-24 yr), 1,765 (25-29 yr) and 1,778 (15-24 yr), 1,813 (25-29 yr) were included from GATS I and II, respectively. Out of the total sample, 9,035 (15-24 yr), 5,673 (25-29 yr) from GATS I and 8,970 (15-24 yr), 5,716 (25-29 yr) from GATS II were included to estimate the prevalence of SHS exposure of non-smoking youths visiting any public places and 1,492 (15-24 yr), 1,538 (25-29 yr) and 1,449 (15-24 yr), 1,532 (25-29 yr) from GATS I and II, respectively, were included for estimating prevalence in non-smoking youths exposed to SHS at all three places in the past month.

GATS I included 33,767 males and 35,529 females, with 41,825 from rural and 27,471 from urban areas. In the 15-24 age group, 42 per cent were males, 57 per cent were females, and 60 per cent were from rural areas. In the 25-29 age group, 35 per cent were males

and 64.7 per cent were females, with a similar rural-urban distribution. GATS II data showed 33,772 males and 40,265 females, with 47,549 from rural and 26,488 from urban areas. In the 15-24 age group, 42 per cent were males, 57 per cent were females, with 65.4 per cent in rural areas. The 25-29 age group had 35 per cent males, 64.2 per cent females, with 64.7 per cent in rural areas.

Prevalence of SHS exposure at home, workplace, public places, and all three places among non-smoking youths in India: The prevalence of exposure to SHS at home, workplace, public places, and a combination of all three places among non-smoking youth (15-24 yr; 25-29 yr) in India across sociodemographic variables and knowledge-related parameters on adverse effects of smoking among adults and children are presented in table I and II, respectively. From GATS I to II, there was a notable decline in the prevalence of SHS exposure at home (15-24: 50 *vs*. 37.6%; 25-29: 49.2 *vs*. 35%) and in public places (15-24: 44 *vs*. 37.8%; 25 29: 42.1 *vs*. 36.8%) among non-smoking youths aged 15-29 yr. The overall prevalence of SHS exposure among non-smoking youths at all three places (15-24: 9 *vs.* 8.6%; 25-29: 11 *vs.* 7%) reduced between GATS I and II. There was a significant decrease in SHS exposure at home and in public places between GATS I and II among non-smoking youths (ages 15-24 and 25-29), influenced by factors such as gender, education level, employment status, place of residence, wealth index, and awareness about adverse effects of smoking. However, SHS exposure in the workplace increased for most variables considered (ages 15-24 and 25-29), though the increases were not statistically significant.

GATS II data revealed SHS exposure among non-smoking youths (15-24 *vs.* 25-29 yr) was: at home (37.6 *vs.* 35%), workplace (26.8 *vs*. 28.1%), and in public places (37.8 *vs*. 36.8%). Among youths aged 15-24 yr, SHS exposure at home and in public places was significantly higher, influenced by gender, education, employment, residence, wealth, and awareness of smoking's harms. Workplace exposure was higher in the 25-29 age group, though results were not significant. Additionally, combined SHS exposure across all three settings was greater in the 15-24 age group (8.6 *vs*. 7%).

Factors affecting exposure to second-hand smoking: Table III and IV compare the risk factors of SHS exposure at home, workplace, public places, and in all these three places between GATS I and GATS II among youths aged 15-24 and 25-29 yr. SHS exposure was more likely at home than in public places among females in GATS I and II, particularly in the 25-29 age group. Exposure at home, workplaces, and all three locations decreased significantly with higher education levels, consistent across both age groups. Self-employed, unemployed, or student respondents faced higher SHS exposure at home than government/ private employees. Rural residents had significantly higher SHS exposure at home and in public in both rounds and age groups. Among respondents in the rich wealth index, SHS exposure at home was lower in both age groups.

Discussion

The study presents a secondary analysis of the nationally representative GATS I and II datasets (2009-10 and 2016-17)[23,24], examining changes in SHS exposure among non-smoking youths (ages 15-24 and 25-29 yr) across home, workplace, and public places. Findings indicate decreased SHS exposure at home and in public places from GATS I to GATS II. However, exposure at the workplace increased, though the change was not statistically significant. The study also highlights that lower awareness of SHS's harmful health effects contributed to higher workplace exposure[25].

A significantly higher likelihood of SHS exposure at home among females was observed in both rounds of the survey: self-employed (at home and workplace) and unemployed or students (at home) as per GATS I. A previous study[26] in India showed similar findings of higher SHS exposure among females at home and higher SHS exposure among males at the workplace and/or in public places. In India, socio-cultural norms link this risk to men's role as primary earners and women's reluctance to challenge their husbands' smoking to maintain family harmony. With limited spaces to avoid SHS exposure at home, this poses a significant concern for women[27-28]. In India, males experience higher SHS exposure at workplaces (indoors) and public places due to their outgoing nature and more prevalent work culture compared to females[29].

Despite smoke-free regulations in many countries, a significant population remains exposed to SHS at home, mainly due to high male smoking rates in many lower-middle income countries (LMICs), which disproportionately expose women to SHS[30-32]. In addition, private homes are outside the legal reach of law, and stringent enforcement of regulations at home

Table I. Prevalence of exposure to SHS at home, workplace, public places, and a combination of three places among non-smoking youth (15-24 yr) in India

	Home			Workplace			Public Places			All three Places		
	GATS I Prevalence (95% CI)	GATS II Prevalence (95% CI)	z (*P* value)	GATS I Prevalence (95% CI)	GATS II Prevalence (95% CI)	z (*P* value)	GATS I Prevalence (95% CI)	GATS II Prevalence (95% CI)	z (*P* value)	GATS I Prevalence (95% CI)	GATS II Prevalence (95% CI)	z (*P* value)
India (N)	12,523	12,668		1,779	1,778		9,035	8,970		1,492	1,449	
Gender												
Male	48.89 (46.22, 51.56)	34.92 (32.75, 37.09)	11.37 (<0.001)	28.13 (24.13, 32.12)	29.72 (25.55, 33.9)	0.63 (0.52)	51.27 (48.64, 53.91)	44.99 (42.53, 47.45)	8.61 (<0.001)	10.12 (7.31, 12.92)	10.19 (6.83, 13.56)	1.13 (0.256)
Female	51.13 (48.63, 53.64)	40.31 (37.92, 42.70)	9.06 (<0.001)	13.25 (8.75, 17.76)	15.11 (9.77, 20.45)	1.35 (0.17)	34.19 (31.53, 36.85)	27.80 (25.52, 30.07)	8.13 (<0.001)	3.91 (0.97, 6.86)	1.31 (0.23, 2.38)	0.70 (0.507)
Level of education												
No formal education	64.87 (60.93, 68.82)	53.50 (47.16, 59.85)	5.00 (<0.001)	42.6 (24.84, 60.36)	36.45 (18.52, 54.38)	1.57 (0.116)	42.51 (35.89, 49.13)	39.23 (31.71, 46.76)	1.01 (0.092)	13.25 (1.07, 25.44)	25.08 (3.82, 46.33)	0.75 (0.451)
Less than primary	57.30 (52.51, 62.08)	45.26 (39.31, 51.2)	2.68 (0.007)	37.59 (24.86, 50.32)	40.52 (26.21, 54.83)	0.38 (0.701)	46.43 (40.37, 52.48)	36.08 (28.76, 43.39)	1.47 (0.073)	7.92 (0.15, 15.69)	10.74 (1.30, 20.17)	0.34 (0.729)
Primary but less than secondary	55.99 (53.17, 58.81)	47.12 (44.5, 49.73)	5.35 (<0.001)	28.53 (22.84, 34.21)	34.56 (28.06, 41.06)	0.70 (0.481)	44.11 (41.02, 47.20)	37.11 (34.03, 40.19)	6.18 (<0.001)	11.85 (7.33, 16.36)	13.47 (7.93, 19.02)	0.26 (0.793)
Secondary and above	37.81 (35.18, 40.43)	29.4 (27.63, 31.17)	8.62 (<0.001)	18.49 (14.46, 22.51)	20.11 (16.42, 23.8)	1.01 (0.314)	43.69 (41.17, 46.22)	38.10 (35.92, 40.28)	9.23 (<0.001)	6.59 (3.71, 9.47)	4.15 (1.78, 6.52)	1.44 (0.064)
Employment												
Govt./Pvt. employees	49.73 (45.93, 53.52)	38.93 (35.75, 42.12)	3.14 (0.001)	26.51 (21.49, 31.53)	30.67 (25.83, 35.51)	1.27 (0.063)	48.78 (44.56, 53.00)	42.01 (38.39, 45.63)	1.50 (0.061)	11.10 (7.34, 14.87)	10.92 (6.64, 15.19)	1.02 (0.305)
Self employed	56.74 (53.08, 60.41)	41.47 (37.01, 45.93)	5.75 (<0.001)	31.68 (25.02, 38.35)	27.32 (19.04, 35.6)	1.45 (0.147)	49.41 (44.82, 54.00)	42.98 (37.45, 48.52)	1.12 (0.081)	9.96 (5.09, 14.82)	6.52 (1.87, 11.17)	1.69 (0.097)
Student	44.14 (41.31, 46.97)	31.63 (29.55, 33.71)	9.64 (<0.001)	13.57 (8.56, 18.58)	16.78 (10.42, 23.14)	0.25 (0.798)	44.65 (41.87, 47.42)	39.18 (36.63, 41.72)	9.18 (<0.001)	3.20 (0.96, 5.45)	5.09 (0.25, 9.92)	0.25 (0.797)
Unemployed	53.8 (50.88, 56.73)	44.68 (41.61, 47.75)	6.95 (<0.001)	25.82 (11.25, 40.39)	31.32 (17.52, 45.13)	1.21 (0.223)	34.65 (31.10, 38.27)	28.13 (25.19, 31.06)	4.41 (<0.001)	7.11 (0.20, 14.03)	5.72 (-2.27, 13.71)	1.07 (0.284)

Contd...

	Home			Workplace			Public Places			All three Places		
	GATS I	GATS II	z (*P* value)	GATS I	GATS II	z (*P* value)	GATS I	GATS II	z (*P* value)	GATS I	GATS II	z (*P* value)
	Prevalence (95% CI)	Prevalence (95% CI)		Prevalence (95% CI)	Prevalence (95% CI)		Prevalence (95% CI)	Prevalence (95% CI)		Prevalence (95% CI)	Prevalence (95% CI)	
Place of residence												
Urban	37.67 (35.06, 40.27)	26.95 (24.32, 29.59)	10.50 (<0.001)	24.46 (20.16, 28.76)	23.12 (18.27, 27.97)	0.04 (0.965)	43.27 (40.62, 45.91)	37.36 (34.36, 40.36)	6.66 (<0.001)	7.97 (4.96, 10.98)	5.10 (2.63, 7.56)	1.55 (0.119)
Rural	54.69 (52.18, 57.2)	42.72 (40.56, 44.88)	11.64 (<0.001)	25.26 (20.44, 30.07)	29.07 (24.13, 34.02)	0.20 (0.839)	44.27 (41.71, 46.83)	38.01 (35.87, 40.15)	9.91 (<0.001)	9.55 (6.16, 12.95)	10.77 (6.54, 15.01)	1.72 (0.084)
Wealth index												
Poor	59.13 (56.46, 61.81)	45.89 (43.12, 48.66)	8.87 (<0.001)	28.87 (21.91, 35.83)	26.20 (20.50, 31.89)	0.49 (0.622)	45.09 (41.81, 48.36)	37.05 (33.99, 40.12)	5.85 (<0.001)	9.79 (5.30, 14.28)	11.6 (6.57, 16.64)	0.28 (0.778)
Middle	49.05 (46.12, 51.97)	35.94 (33.63, 38.25)	9.7 (<0.001)	24.97 (20.32, 29.61)	29.87 (23.94, 35.81)	0.38 (0.699)	43.10 (40.20, 45.99)	36.94 (34.35, 39.52)	8.59 (<0.001)	8.51 (4.80, 12.22)	6.85 (2.88, 10.83)	1.57 (0.115)
Rich	32.29 (29.52, 35.06)	29.42 (26.04, 32.8)	1.91 (0.061)	20.01 (14.87, 25.16)	22.61 (16.32, 28.91)	0.87 (0.382)	43.71 (40.54, 46.89)	40.03 (37.00, 43.07)	0.90 (0.251)	8.31 (4.23, 12.38)	8.56 (2.39, 14.72)	1.63 (0.101)
Knowledge of smoking causes												
Stroke	48.08 (45.53, 50.63)	35.47 (33.70, 37.24)	10.90 (<0.001)	22.11 (18.16, 26.07)	28.05 (23.84, 32.26)	1.35 (0.175)	46.47 (43.98, 48.97)	38.92 (36.81, 41.02)	9.43 (<0.001)	7.41 (4.68, 10.14)	7.40 (4.84, 9.95)	1.05 (0.291)
Heart attack	48.13 (45.88, 50.39)	35.03 (33.34, 36.73)	12.42 (<0.001)	23.08 (19.68, 26.49)	26.91 (23.04, 30.78)	1.20 (0.230)	45.05 (42.81, 47.28)	38.52 (36.53, 40.51)	9.68 (<0.001)	7.95 (5.42, 10.47)	8.61 (5.55, 11.68)	0.88 (0.379)
Lung cancer	49.33 (47.23, 51.42)	37.31 (35.55, 39.06)	14.01 (<0.001)	23.91 (20.66, 27.16)	26.99 (23.32, 30.67)	0.39 (0.695)	44.56 (42.54, 46.58)	38.05 (36.26, 39.85)	11.62 (<0.001)	8.71 (6.31, 11.11)	8.76 (5.89, 11.63)	1.58 (0.114)
Serious illness	49.58 (47.53, 51.62)	37.59 (35.81, 39.37)	13.64 (<0.001)	24.25 (21.02, 27.47)	26.97 (23.22, 30.72)	0.14 (0.889)	44.14 (42.15, 46.13)	37.70 (35.91, 39.48)	11.81 (<0.001)	8.55 (6.21, 10.88)	8.66 (5.74, 11.59)	1.53 (0.126)
Knowledge/believe that SHS causes												
Serious illness in adults	49.48 (47.37, 51.58)	36.93 (35.16, 38.71)	14.01 (<0.001)	24.18 (20.86, 27.51)	27.6 (23.85, 31.35)	-0.71 (0.478)	45.03 (42.98, 47.08)	38.08 (36.31, 39.85)	12.16 (<0.003)	8.47 (6.17, 10.78)	8.54 (5.62, 11.47)	1.91 (0.071)
Serious illness in child	NA	37.08 (35.32, 38.83)		NA	27.25 (23.60, 30.89)		NA	38.13 (36.35, 39.91)		NA	8.26 (-1.67, 38.61)	

Note: Prevalence is computed in percentage. SHS, second-hand smoke; CI, confidence intervals; Govt., government; Pvt., private

Table II. Prevalence of exposure to SHS at home, workplace, public places, and a combination of three places among non-smoking youth (25-29 yr) in India

	Home			Workplace			Public places			All three places		
	GATS I	GATS II	z (*P* value)	GATS I	GATS II	z (*P* value)	GATS I	GATS II	z (*P* value)	GATS I	GATS II	z (*P* value)
	Prevalence (95% CI)	Prevalence (95% CI)		Prevalence (95% CI)	Prevalence (95% CI)		Prevalence (95% CI)	Prevalence (95% CI)		Prevalence (95% CI)	Prevalence (95% CI)	
India (N)	8,081	8,259		1,765	1,813		5,673	5,716		1,538	1,532	
Gender												
Male	45.81 (42.64, 48.97)	31.00 (28.32, 33.68)	9.28 (<0.001)	31.82 (27.37, 36.27)	30.89 (26.69, 35.09)	0.42 (0.671)	52.40 (49.06, 55.74)	47.46 (44.36, 50.56)	1.95 (0.062)	12.99 (9.23, 16.74)	8.03 (5.50, 10.57)	0.88 (0.378)
Female	51.89 (49.15, 54.62)	38.40 (36.12, 40.67)	7.62 (<0.001)	17.70 (12.35, 23.05)	16.51 (10.77, 22.25)	1.01 (0.313)	31.15 (28.27, 34.02)	24.80 (22.42, 27.18)	5.88 (<0.001)	3.78 (1.44, 6.12)	2.44 (0.56, 4.32)	1.44 (0.064)
Level of education												
No formal education	61.50 (57.31, 65.69)	51.28 (47.09, 55.47)	3.59 (<0.001)	35.18 (21.44, 48.92)	36.77 (25.37, 48.17)	0.79 (0.426)	37.21 (31.85, 42.56)	33.06 (27.65, 38.47)	1.76 (0.077)	9.40 (0.84, 17.96)	14.31 (3.32, 25.3)	0.01 (0.988)
Less than primary	50.96 (45.35, 56.57)	44.07 (39.13, 49.01)	1.85 (0.073)	27.83 (15.02, 40.64)	49.88 (35.63, 64.13)	1.69 (0.090)	37.49 (31.41, 43.56)	35.29 (28.67, 41.91)	0.76 (0.447)	9.35 (-0.79, 19.5)	22.52 (6.97, 38.08)	1.25 (0.208)
Primary but less than secondary	54.24 (50.64, 57.84)	37.72 (34.80, 40.64)	7.50 (<0.001)	39.43 (31.66, 47.20)	34.31 (26.15, 42.46)	0.91 (0.358)	44.67 (40.43, 48.91)	37.69 (33.66, 41.71)	1.66 (0.071)	19.25 (11.38, 27.13)	7.79 (3.91, 11.06)	2.00 (0.045)
Secondary and above	35.32 (31.81, 38.83)	26.20 (23.73, 28.67)	6.62 (<0.001)	23.07 (18.67, 27.48)	22.48 (18.45, 26.50)	0.24 (0.808)	43.39 (41.09, 46.68)	37.43 (34.55, 40.31)	4.63 (<0.001)	7.88 (4.88, 10.88)	4.87 (2.50, 7.24)	1.56 (0.117)
Employment												
Govt./Pvt. employees	44.72 (40.97, 48.47)	31.43 (28.66, 34.20)	6.00 (<0.001)	25.5 (20.78, 30.22)	25.39 (21.19, 29.58)	0.77 (0.436)	45.29 (41.33, 49.26)	42.09 (38.67, 45.52)	1.37 (0.077)	10.35 (6.38, 14.32)	5.64 (3.56, 7.73)	1.54 (0.122)
Self employed	53.60 (49.87, 57.32)	37.56 (33.29, 41.84)	7.04 (<0.001)	32.61 (26.22, 39.00)	34.94 (27.39, 42.48)	0.13 (0.895)	46.80 (42.50, 51.09)	45.53 (40.75, 50.31)	1.05 (0.291)	12.43 (7.31, 17.55)	9.29 (4.50, 14.09)	0.78 (0.433)
Student	31.66 (21.62, 41.69)	18.95 (12.89, 25.01)	1.00 (0.316)	14.14 (-0.94, 29.22)	35.64 (15.13, 56.16)	1.89 (0.067)	49.63 (38.58, 60.67)	39.69 (29.70, 49.68)	1.07 (0.067)	2.90 (-1.76, 7.57)	10.98 (-1.27, 23.23)	1.31 (0.188)
Unemployed	50.15 (47.03, 53.28)	38.46 (35.87, 41.05)	6.06 (<0.001)	42.01 (24.50, 59.51)	39.90 (19.22, 60.57)	0.41 (0.679)	34.28 (30.69, 37.88)	25.28 (22.53, 28.03)	5.51 (<0.001)	9.59 (-1.01, 20.18)	22.92 (-3.99, 49.84)	0.89 (0.369)

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	Home			Workplace			Public places			All three places		
	GATS I Prevalence (95% CI)	GATS II Prevalence (95% CI)	z (*P* value)	GATS I Prevalence (95% CI)	GATS II Prevalence (95% CI)	z (*P* value)	GATS I Prevalence (95% CI)	GATS II Prevalence (95% CI)	z (*P* value)	GATS I Prevalence (95% CI)	GATS II Prevalence (95% CI)	z (*P* value)
Place of residence												
Urban	34.91 (31.85, 37.96)	24.41 (21.81, 27.01)	7.93 (<0.001)	27.34 (22.72, 31.95)	25.39 (20.39, 30.39)	0.84 (0.397)	41.98 (39.57, 45.38)	35.75 (32.28, 39.21)	2.73 (0.006)	7.47 (4.66, 10.27)	5.89 (2.89, 8.90)	0.87 (0.379)
Rural	55.33 (52.46, 58.19)	40.69 (38.47, 42.91)	9.83 (<0.001)	29.67 (23.96, 35.38)	30.39 (25.37, 35.41)	0.52 (0.597)	42.14 (39.16, 45.12)	37.48 (34.99, 39.00)	5.69 (<0.001)	14.57 (9.18, 19.95)	8.02 (5.09, 10.96)	1.11 (0.084)
Wealth index												
Poor	60.79 (57.58, 64.00)	48.65 (45.38, 51.92)	5.13 (<0.001)	36.28 (27.13, 45.43)	35.54 (28.18, 42.90)	0.69 (0.488)	40.39 (36.31, 44.47)	37.33 (33.35, 41.30)	1.43 (0.064)	17.35 (8.38, 26.33)	11.39 (5.61, 17.17)	1.21 (0.066)
Middle	46.16 (42.92, 49.41)	31.47 (28.95, 33.99)	9.52 (<0.001)	26.99 (21.67, 32.31)	28.04 (22.18, 33.90)	0.63 (0.523)	43.84 (40.29, 47.40)	36.72 (33.49, 39.95)	4.76 (<0.001)	11.01 (6.78, 15.24)	6.65 (3.22, 10.08)	1.22 (0.219)
Rich	33.28 (29.61, 36.96)	24.66 (21.74, 27.59)	5.45 (<0.001)	25.95 (20.12, 31.79)	23.56 (18.29, 28.83)	0.43 (0.664)	41.74 (37.89, 45.59)	36.56 (32.99, 40.13)	1.93 (0.063)	7.83 (3.47, 12.19)	5.20 (2.66, 7.73)	0.43 (0.660)
Knowledge of smoking causes												
Stroke	48.37 (45.51, 51.23)	32.68 (30.63, 34.74)	8.99 (<0.001)	28.77 (23.72, 33.83)	28.25 (23.93, 32.56)	0.68 (0.491)	44.55 (41.46, 47.64)	38.29 (35.82, 40.76)	3.46 (<0.001)	11.69 (7.55, 15.83)	6.28 (4.13, 8.42)	1.39 (0.164)
Heart attack	46.88 (44.24, 49.51)	32.74 (30.86, 34.63)	10.47 (<0.001)	27.11 (22.92, 31.30)	27.80 (23.86, 31.74)	0.54 (0.586)	42.66 (39.89, 45.43)	38.23 (35.96, 39.49)	4.30 (0.001)	9.74 (6.36, 13.13)	6.52 (4.46, 8.59)	1.16 (0.244)
Lung cancer	48.10 (45.75, 50.46)	34.69 (32.91, 36.47)	10.79 (<0.001)	28.35 (24.53, 32.16)	27.99 (24.35, 31.63)	0.19 (0.844)	42.72 (40.33, 45.12)	37.14 (35.07, 39.22)	6.14 (<0.001)	11.21 (8.06, 14.36)	7.07 (4.92, 9.23)	1.79 (0.072)
Serious illness	48.60 (46.27, 50.93)	34.66 (32.86, 36.46)	11.27 (<0.001)	28.43 (24.66, 32.21)	28.44 (24.72, 32.16)	0.38 (0.699)	42.76 (40.40, 45.12)	36.64 (34.58, 38.71)	6.22 (<0.001)	11.04 (7.94, 14.14)	7.24 (5.04, 9.44)	1.69 (0.091)
Knowledge that SHS causes												
Serious illness in adults	48.20 (45.77, 50.64)	34.37 (32.59, 36.16)	11.24 (<0.001)	28.06 (24.22, 31.91)	27.91 (24.21, 31.60)	-0.23 (0.817)	44.07 (41.65, 46.49)	36.87 (34.78, 38.96)	6.62 (<0.001)	11.4 (8.2, 14.6)	7.26 (5.09, 9.43)	1.78 (0.075)
Serious illness in child	*NA*	34.43 (32.65, 36.2)		*NA*	28.03 (24.32, 31.74)		*NA*	37.08 (35.01, 39.15)		*NA*	7.21 (5.06, 9.36)	

Note: Prevalence is computed in percentage

Table III. Factors affecting SHS exposure among non-smoking youth (15-24 yr) in India

	Home		Workplace		Public Places		All three Places	
	GATS I	GATS II	GATS I	GATS II	GATS I	GATS II	GATS I	GATS II
	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)
Gender								
Male ®								
Female	1.02 (0.98, 1.06)	1.15 (1.09, 1.21)	0.84 (0.70, 1.00)	0.68 (0.55, 0.84)	0.74 (0.7, 0.78)	0.69 (0.65, 0.74)	0.82 (0.56, 1.20)	0.44 (0.24, 0.82)
Level of education								
No formal education ®								
Less than primary	0.93 (0.87, 1.00)	1.01 (0.91, 1.12)	0.94 (0.68, 1.30)	1.14 (0.76, 1.73)	0.93 (0.81, 1.06)	1.02 (0.85, 1.24)	0.75 (0.36, 1.55)	0.86 (0.36, 2.05)
Primary but less than secondary	0.93 (0.88, 0.98)	1.04 (0.97, 1.12)	0.74 (0.56, 0.97)	0.98 (0.70, 1.36)	0.89 (0.80, 0.99)	0.96 (0.83, 1.12)	0.61 (0.33, 1.11)	0.80 (0.42, 1.53)
Secondary and above	0.73 (0.68, 0.78)	0.75 (0.69, 0.81)	0.54 (0.40, 0.72)	0.69 (0.49, 0.97)	0.89 (0.80, 0.99)	0.94 (0.81, 1.09)	0.44 (0.23, 0.82)	0.35 (0.17, 0.70)
Employment								
Govt./Pvt. employees ®								
Self employed	1.16 (1.08, 1.24)	1.09 (1.01, 1.19)	1.33 (1.11, 1.59)	0.95 (0.77, 1.17)	1.02 (0.94, 1.11)	1.06 (0.96, 1.18)	1.08 (0.76, 1.54)	0.76 (0.45, 1.30)
Student	1.12 (1.05, 1.19)	0.99 (0.93, 1.07)	0.87 (0.69, 1.11)	0.66 (0.52, 0.83)	1.02 (0.95, 1.09)	0.97 (0.89, 1.04)	0.66 (0.42, 1.06)	0.81 (0.49, 1.35)
Unemployed	1.15 (1.08, 1.23)	1.05 (0.98, 1.12)	1.38 (0.98, 1.93)	0.86 (0.59, 1.25)	0.90 (0.82, 0.98)	0.94 (0.85, 1.04)	1.40 (0.71, 2.72)	1.02 (0.42, 2.45)
Place of residence								
Urban ®								
Rural	1.21 (1.16, 1.26)	1.35 (1.28, 1.43)	1.18 (1.00, 1.40)	1.17 (0.98, 1.40)	1.10 (1.05, 1.16)	1.07 (1.00, 1.14)	1.63 (1.17, 2.28)	1.48 (0.98, 2.23)
Wealth index								
Poor ®								
Middle	0.92 (0.88, 0.96)	0.93 (0.88, 0.97)	0.99 (0.82, 1.20)	0.99 (0.81, 1.20)	1.03 (0.97, 1.10)	0.98 (0.91, 1.06)	0.86 (0.57, 1.29)	0.68 (0.44, 1.06)
Rich	0.76 (0.72, 0.80)	0.83 (0.78, 0.89)	0.99 (0.79, 1.24)	1.11 (0.87, 1.41)	1.03 (0.95, 1.10)	1.09 (1.00, 1.19)	1.25 (0.81, 1.95)	1.11 (0.66, 1.86)
Knowledge of smoking causes								
Stroke								
No ®								
Yes	0.99 (0.95, 1.03)	0.99 (0.95, 1.05)	0.99 (0.83, 1.21)	1.14 (0.92, 1.41)	1.04 (0.98, 1.10)	1.03 (0.95, 1.10)	0.97 (0.65, 1.44)	0.99 (0.65, 1.52)
Heart attack								
No ®								
Yes	0.97 (0.93, 1.02)	0.94 (0.88, 1.00)	0.91 (0.73, 1.14)	1.12 (0.85, 1.46)	0.96 (0.90, 1.02)	1.03 (0.94, 1.13)	0.73 (0.47, 1.14)	1.17 (0.69, 1.99)

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	Home		Workplace		Public Places		All three Places	
	GATS I	GATS II	GATS I	GATS II	GATS I	GATS II	GATS I	GATS II
	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)
Lung cancer								
No ®								
Yes	1.05 (0.97, 1.14)	1.02 (0.92, 1.13)	1.12 (0.76, 1.64)	1.18 (0.65, 2.11)	1.04 (0.92, 1.19)	1.12 (0.92, 1.37)	1.09 (0.46, 2.58)	NA
Serious illness								
No ®								
Yes	1.13 (1.02, 1.24)	1.20 (1.09, 1.32)	1.07 (0.70, 1.64)	0.80 (0.58, 1.11)	0.97 (0.83, 1.13)	0.91 (0.80, 1.03)	0.86 (0.34, 2.17)	1.96 (0.65, 5.87)
Knowledge that SHS causes								
Serious illness in adults								
No ®								
Yes	1.07 (1.01, 1.14)	0.97 (0.86, 1.09)	0.96 (0.73, 1.27)	1.27 (0.74, 2.18)	1.27 (1.14, 1.41)	1.05 (0.86, 1.29)	1.14 (0.6, 2.2)	1.5 (0.49, 4.63)
Serious illness in children								
No ®								
Yes	*NA*	0.97 (0.85, 1.09)	*NA*	1.48 (0.79, 2.77)	*NA*	1.16 (0.92, 1.46)	*NA*	0.58 (0.21, 1.61)
Constant	0.41 (0.37, 0.46)	0.33 (0.29, 0.38)	0.32 (0.20, 0.51)	0.16 (0.07, 0.34)	0.41 (0.35, 0.49)	0.32 (0.24, 0.42)	0.17 (0.07, 0.43)	0.01 (0.00, 0.02)

PR, prevalence ratio; ®, reference category

Table IV. Factors affecting SHS exposure among non-smoking youth (25-29 yr) in India

	Home		Workplace		Public places		All three places	
	GATS I	GATS II	GATS I	GATS II	GATS I	GATS II	GATS I	GATS II
	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)
Gender								
Male ®								
Female	1.09 (1.02, 1.15)	1.17 (1.09, 1.27)	0.70 (0.58, 0.86)	0.60 (0.49, 0.75)	0.70 (0.64, 0.76)	0.64 (0.58, 0.71)	0.96 (0.67, 1.37)	0.53 (0.31, 0.90)
Level of education								
No formal education ®								
Less than primary	0.95 (0.88, 1.03)	1.02 (0.93, 1.12)	1.04 (0.69, 1.55)	1.20 (0.86, 1.66)	0.99 (0.85, 1.15)	1.03 (0.87, 1.22)	0.76 (0.30, 1.91)	1.16 (0.55, 2.45)
Primary but less than secondary	0.99 (0.93, 1.05)	0.95 (0.88, 1.02)	1.05 (0.75, 1.45)	0.84 (0.64, 1.11)	1.01 (0.90, 1.14)	0.96 (0.84, 1.10)	1.25 (0.62, 2.53)	0.65 (0.33, 1.29)
Secondary and above	0.77 (0.71, 0.82)	0.73 (0.67, 0.80)	0.76 (0.54, 1.07)	0.61 (0.45, 0.81)	1.05 (0.93, 1.19)	0.97 (0.84, 1.11)	0.82 (0.39, 1.73)	0.38 (0.18, 0.77)
Employment								
Govt./Pvt. employees ®								
Self employed	1.14 (1.06, 1.22)	1.18 (1.09, 1.28)	1.38 (1.16, 1.63)	1.41 (1.19, 1.67)	1.01 (0.93, 1.1)	1.04 (0.95, 1.14)	1.32 (0.93, 1.89)	1.68 (1.11, 2.55)

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	Home		Workplace		Public places		All three places	
	GATS I	GATS II	GATS I	GATS II	GATS I	GATS II	GATS I	GATS II
	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)
Student	0.98 (0.84, 1.14)	1.23 (1.04, 1.45)	0.61 (0.29, 1.31)	1.35 (0.79, 2.30)	1.09 (0.95, 1.25)	0.96 (0.81, 1.14)	0.58 (0.15, 2.30)	2.48 (0.98, 6.28)
Unemployed	1.06 (0.99, 1.14)	1.16 (1.07, 1.24)	1.15 (0.79, 1.67)	1.14 (0.75, 1.74)	0.98 (0.89, 1.08)	0.92 (0.82, 1.02)	0.72 (0.29, 1.75)	1.77 (0.72, 4.36)
Place of residence								
Urban ®								
Rural	1.23 (1.17, 1.30)	1.29 (1.2, 1.38)	1.10 (0.93, 1.31)	1.13 (0.94, 1.36)	1.18 (1.10, 1.26)	1.08 (0.99, 1.17)	1.68 (1.17, 2.43)	1.45 (0.95, 2.20)
Wealth index								
Poor ®								
Middle	0.91 (0.86, 0.96)	0.81 (0.76, 0.86)	0.94 (0.75, 1.18)	0.86 (0.70, 1.05)	1.03 (0.94, 1.12)	0.96 (0.88, 1.06)	0.65 (0.43, 0.98)	0.99 (0.61, 1.59)
Rich	0.78 (0.73, 0.84)	0.75 (0.69, 0.82)	0.91 (0.70, 1.18)	0.87 (0.68, 1.11)	1.03 (0.93, 1.14)	1.05 (0.94, 1.17)	0.57 (0.34, 0.96)	1.18 (0.66, 2.09)
Knowledge of smoking causes								
Stroke								
No ®								
Yes	1.01 (0.95, 1.06)	0.99 (0.93, 1.07)	1.01 (0.83, 1.23)	1.04 (0.84, 1.29)	0.97 (0.90, 1.05)	1.08 (0.98, 1.20)	1.15 (0.79, 1.66)	0.85 (0.49, 1.47)
Heart attack								
No ®								
Yes	0.99 (0.94, 1.06)	0.93 (0.86, 1.00)	0.93 (0.74, 1.17)	1.01 (0.78, 1.29)	0.96 (0.88, 1.04)	1.06 (0.93, 1.19)	0.78 (0.51, 1.21)	1.26 (0.64, 2.46)
Lung cancer								
No ®								
Yes	0.97 (0.89, 1.06)	1.17 (1.03, 1.32)	0.93 (0.62, 1.39)	0.89 (0.57, 1.4)	1.10 (0.93, 1.3)	1.08 (0.86, 1.35)	1.5 (0.65, 3.46)	1.49 (0.36, 6.19)
Serious illness								
No ®								
Yes	1.14 (1.02, 1.27)	1.06 (0.95, 1.19)	1.18 (0.73, 1.93)	1.30 (0.91, 1.87)	1.03 (0.84, 1.27)	0.94 (0.8, 1.1)	0.97 (0.35, 2.67)	1.44 (0.55, 3.78)
Knowledge that SHS causes								
Serious illness in adults								
No ®								
Yes	1.04 (0.97, 1.11)	1.06 (0.92, 1.23)	0.90 (0.68, 1.20)	0.83 (0.55, 1.25)	1.30 (1.14, 1.49)	1.01 (0.8, 1.28)	1.40 (0.71, 2.76)	1.92 (0.56, 6.55)
Serious illness in children								
No ®								
Yes	NA	0.86 (0.73, 1)	NA	1.14 (0.64, 2.05)	NA	1.12 (0.84, 1.49)	NA	1.44 (0.21, 10.09)
Constant	0.41 (0.36, 0.46)	0.34 (0.29, 0.39)	0.30 (0.18, 0.48)	0.32 (0.18, 0.57)	0.30 (0.25, 0.37)	0.34 (0.25, 0.46)	0.06 (0.02, 0.20)	0.02 (0.00, 0.17)

is difficult for any authority[26]. However, a few studies have shown that implementing smoke-free regulations in both workplaces and public places leads to a decrease in the prevalence of smoking within homes[33-36]. A study[37] reported higher SHS exposure among self-employed individuals than among government employees. Despite a decline in SHS exposure overall, increased exposure at work may persist due to weak enforcement of smoke-free regulations, non-compliance, poor workplace design, cultural norms, and limited policy scope[38].

The study findings show that rural respondents showed a higher likelihood of increased SHS exposure (at home and in public places). This result was concurrent with the findings from studies in China, India, and other South Asian countries[29,39-42]. The higher prevalence in rural areas may be linked to low levels of education, economic status, and knowledge regarding the ill effects of SHS exposure[43]. These findings call for strict enforcement of the existing COTPA laws in India, creating mass awareness, and implementing anti-tobacco campaigns *via* community-led interventions targeting youths.

Respondents with secondary or higher education and those from middle or wealthy households had lower SHS exposure at home and in the workplace. On a similar line, Nazar *et al*[44] (2016) found that individuals with lower education faced higher SHS exposure at home. Similar to the study findings, the National Health and Nutrition Examination Survey (2013–16) reported lower SHS exposure among youth from higher-income families[45]. Over 30 per cent of the working population across regions were exposed to SHS at work. In India, regional variations indicate that 36.9 per cent of the Northern region and 20.2 per cent of the Central region reported workplace SHS exposure[46].

Interventions to monitor and reduce SHS exposure are urgently needed. To safeguard non-smokers, particularly youths, the WHO developed a global action strategy under FCTC Article 8, mandating the elimination of tobacco smoke from all indoor workplaces and public spaces[47]. In line with the WHO FCTC standards, India also formulated the COTPA, under which, in Section 4, smoking in public areas is forbidden, among other steps to reduce tobacco consumption[21]. According to a 2019 report, around 60-70 per cent of public places became smoke-free in India[48]. However, the law enables specified smoking areas in public places like restaurants or workplaces with a minor fine for violations. The Ministry of Health and Family Welfare, Government of India, has initiated a national campaign featuring a 30-second Public Service Announcement titled ‘Clinical’ to highlight the severe health risks associated with SHS exposure[49]. Despite regulations, the Government of India faces challenges in enforcing tobacco control uniformly across the States, leading to increased tobacco use and SHS exposure. Targeted education, community interventions, smoke-free housing policies, and cessation resources are crucial to prevent smoking at home, especially in low-income households. Reducing SHS exposure at home requires more than banning smoking in public spaces.

This study has a few limitations. The GATS I and II datasets were cross-sectional, limiting the ability to analyse temporal relationships and associations. Additionally, the focus on core socio demographic factors excluded variables like marital status and household composition to keep the analysis concise. Future research could include these factors for a more comprehensive understanding of SHS exposure among non-smoking youths. As measured by self-reporting, SHS exposure may not accurately reflect actual exposure. Finally, as a secondary analysis, the study could not assess the reasons behind the limited knowledge of SHS health risks.

Overall, the study provides a broad understanding of the variations in the prevalence of SHS exposure among non-smoking youth between the two rounds of GATS, India (2009-10 to 2016-17). Between the rounds of the GATS, India, SHS exposure had reduced at home and in public places but increased at the workplace among non-smoking youths. Factors such as female gender (workplace and public place), secondary level or higher education in all four cases (at home, workplaces, public places, and in all three places), and belonging to the middle or rich wealth index households (home) showed a lower risk of SHS exposure for both rounds of the survey. However, rural residence (home and public places) in GATS I and self-employed (home and workplace) for both rounds showed a higher risk of SHS exposure. A plethora of initiatives and investments at the national and sub-national level on tobacco control, including smoke-free environment policies, are being implemented. However, the study findings reflect an increase in SHS exposure at the workplace among non-smoking youths with significant variation in the SHS exposure at home, workplace, and public places by the socio demographic factors. The study findings, hence, must be used to develop multi-

sectoral and targeted community-based interventions in India, along with stringent implementation of anti-tobacco legislation in protecting youths who do not smoke from SHS exposure and smoking initiation.

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