

A Study on Prevalence of Smokeless Tobacco in Assam Based on Global Adult Tobacco Survey India 2009-10 data

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Abstract:

*Tobacco use is a major preventable cause of premature death and disease. Globally, it causes over five million deaths each year. Smokeless tobacco (SLT) is available in many forms in India and is widely used by all social groups. India is the second largest consumer of tobacco products and third largest producer of tobacco in the world. In this paper an attempt has been made to study the prevalence of smokeless tobacco in Assam based on **Global Adult Tobacco Survey (GATS) India 2009-10 data**. The present study reveals that there is significant association between use of smokeless tobacco and age, gender, occupation, educational qualification of the respondents. There is an urgent need to take effective steps, especially on launching community awareness programs for the school children and public to educate them about the consequences of tobacco use and on assessing their effectiveness in curbing this burning problem.*

Key Words: Assam, Chi-square test, GATS, p-value. Smokeless tobacco.

1. Introduction:

Tobacco is a green, leafy plant that is grown in warm countries. After it is picked, it is dried, ground up and used in different ways. It can be smoked in a cigarette, pipe or cigar. It can be chewed (called smokeless tobacco or chewing tobacco) or sniffed through the nose (called snuff^[2]). Human beings have been using tobacco since 600 A.D.^[1]. In India, it was introduced by the Portuguese^[1]. Earlier, tobacco was generally smoked using different types of pipes or as cigars or consumed orally (smokeless tobacco).

Smokeless tobacco (SLT) is available in many forms in India and is widely used by all social groups. There is a wide variety of morbidity and mortality related to Smokeless tobacco (SLT) use, but Smokeless tobacco (SLT) has not yet received the attention it deserves as a public health problem. In India, betel quid chewing, *mishri*, *khaini*, *gutka*, *snuff* and as an ingredient of *pan masala* are widely used by all social groups.

Betel quid is a combination of betel leaf, areca nut, slaked lime, tobacco, catechu and condiments according to individual preferences. **Khaini** consists of roasted tobacco flakes mixed with slaked lime. This mixture is prepared by the user keeping the ingredients on the left palm and rubbing it with the right thumb. The prepared pinch is kept in the lower labial or buccal sulcus. Its use is common in eastern India. **Mawa** is a mixture of areca nut, tobacco and slaked lime and is chewed. Its use is common in rural areas of Gujarat province. It is quite popular among the young population of ages 15-19. **Snuff** is a black-brown powder obtained from tobacco through roasting and pulverization. Snuff is used via nasal insufflations and is popular in eastern parts of the country. It is also applied on the gum by finger (this practice is usually initiated as a dentifrice) in the Western India, where it is known as *bajar* and *mishri*. **Gutka** is a manufactured smokeless tobacco product (MSTP), a mixture of areca nut, tobacco and some condiments, marketed in different flavors in colorful pouches. **Pan Masala** is a betel quid mixture, which contains areca nut and some condiments, but may or may not contain tobacco.

Tobacco use is a major preventable cause of premature death and disease, currently leading to over five million deaths each year worldwide. It is also expected to rise to over eight million deaths yearly by 2030^[3]. The vast majority of these deaths are projected to occur in developing countries. Nearly 8–9 lakh people die

every year in India due to diseases related to tobacco use^[4]. Non-communicable diseases (NCDs) like ischemic heart diseases, cancers, diabetes, chronic respiratory diseases are the leading causes of death globally and associated with tobacco use. Available data from WHO demonstrate that thirty-eight million people die each year from NCDs, of which nearly 85% of NCD deaths occur in low- and middle-income countries. Almost 40 percent of tuberculosis deaths in the country are associated with smoking^[4]. Smokeless tobacco use is a significant health risk and cause of death. Smokeless tobacco and snuff contain 3,000 chemicals^[6] including 28 carcinogens (cancer-causing agents)^[7] which include: *Formaldehyde, Arsenic, Polonium-210, Cadmium, Acetone, Ammonia, Nicotine, and Nickel*. Nicotine, a highly addictive substance is the main ingredient in smokeless tobacco. Nicotine from smokeless tobacco stays in the bloodstream for a longer time when compared to cigarettes. In addition to a number of other disease risks; smokeless tobacco use raises women's risk of adverse reproductive outcomes. Using SLT during pregnancy results in (i) 70% higher risk of anemia in pregnant women (ii) 2–3 times' higher rate of low birth weight (iii) 2–3 time's higher rate of still birth.^[5]

Adolescents are the most vulnerable population to initiate tobacco use. Adolescents and children are the prime targets of the tobacco industry when recruiting new smokers. About 20 million children of ages 10-14 are estimated to be tobacco-addicted according to a survey done by the National Sample Survey Organization of the Indian Government^[5]. To this astounding figure, about 5500 new users are added every day, making two million new users every year. Adolescents typically become addicted to nicotine while still being teenagers. Usual interval between the first cigarette consumption and daily smoking is 1-2 year(s). More than half of the adolescent smokers try to quit smoking every year with fewer than 20% being able to quit for a month^[5].

India is the second largest consumer of tobacco products and third largest producer of tobacco in the world^[5]. The Smokeless tobacco (SLT) market in India is the world's largest. Over the last two decades, the Smokeless tobacco (SLT) industry in India has grown exponentially, mostly in the unorganized sector. About 14% of land under tobacco cultivation is used for growing Smokeless tobacco (SLT) varieties, and one-fifth of total tobacco production is used for Smokeless tobacco (SLT)^[5]. Excise revenue from chewing tobacco has increased 15-fold in 10 years, from Rs 722 million in 1990-1991 to Rs 10,532 million in 2010-2011^[5].

Globally a large amount of research and surveys show that education is an important predictor of Smokeless tobacco use. People without an education or with little education consume smokeless tobacco more than literate or highly educated people^[3]. In India, despite numerous efforts at both the policy and administrative levels, the menace of tobacco use is never gotten under control^[3].

Observing the various health hazards of smokeless tobacco, this research is aimed to study the prevalence of smokeless tobacco in Assam based on the Global Adult Tobacco survey India 2009-10 data.

2. Sources of data and methodology:

This study is based on the secondary analysis of the Global Adult Tobacco Survey India 2009-10 data. This survey data was released for the general researchers by International Institute for Population Sciences. The Global Adult Tobacco Survey India (GATS India) is the global standard for systematically monitoring adult tobacco use (smoking and smokeless) and tracking key tobacco control indicators. GATS India is conducted globally in around 14 countries. The center for Disease control and Prevention (CDC), CDC Foundation, Johns Hopkins Bloomberg School of Public Health (JHSPH), Research Triangle Institute International (RTI International), the World Health Organization and many countries through the world worked together to design and implement GATS. For each participating country, a standard protocol with respect to questionnaire, sample design, data collection and management procedures was used. Survey information was collected using handheld devices. The Ministry of Health and Family Welfare, Government of India, designated the International Institute for Population Sciences, as the nodal agency for conducting GATS Survey in India. The main objectives of the GATS India Survey were to measure the impact of tobacco control efforts through implementation of different provisions of COTPA 2003 and its regulations and to systematically monitor adult tobacco use and track key tobacco control indicators. Further information regarding the guidelines followed to collect the data is available in the GATS-India report.

Global Adult Tobacco Survey India(2009-10) is a nationally representative household survey covering population aged 15 years and above, covering all the 29 states of the country and 2 Union Territories of Chandigarh and Pondicherry, in India. Multistage sampling procedure was adopted independently in each state, and within the states, independently in urban and rural areas to select the sample. In the urban areas, three-stage sampling was adopted for the selection of households. At the first stage, a list of wards from all cities and towns of the state/UT formed the urban sampling frame from which a required sample of wards, i.e. primary sampling units (PSUs), was selected using probability proportional to size (PPS) sampling. At the second stage, a list of census enumeration blocks (CEBs) in every selected ward formed the sampling frame from which one CEB was selected by PPS from each selected ward. At the third stage, a list of all the residential households in each selected CEB formed the sampling frame from which a sample of the required number of households was selected. In the rural areas, two-stage sampling was adopted for the selection of households. The PSUs were villages selected using the PPS Sampling method. At the second stage, a list of all the residential households in each selected village formed the sampling frame from which a sample of the required number of households was selected. From each eligible household, one respondent was selected.

Complete data is available for 69,296 adult respondents age 15 and above, of which 33,767 and 35,529 were males and females respectively. The survey covered domains tobacco use (smoking and smokeless tobacco) exposure to second hand smoke, cessation, economics of tobacco, exposure to media messages on tobacco use, and knowledge, attitudes and perceptions towards tobacco use. The survey was designed to provide estimates of the tobacco prevalence at the national and the state levels, and by certain specific background characteristics. Data for tobacco use was collected from the eligible respondents aged 15 years and above. The respondents were asked about their daily and occasional use of tobacco. Smoking tobacco includes beedies, cigarettes, cigars, cheroots, rolled cigarettes, tobacco rolled in maize leaf and newspaper, hookah, pipes, chillum and chutta. Smokeless tobacco included tobacco leaf, betel quid with tobacco, sada/surti, khaini or tobacco lime mixture, and gutkha, pan masala with zarda, gul, gudaku, and misiri. Final sample included in the study were all the 5203 respondents of Assam of which 2600 and 2603 were males and females respectively. In this present study the researcher only address the smokeless part of tobacco used in Assam.

To meet the objectives of the present study various descriptive techniques was used and chi-square test for independence of attributes is used to estimate the prevalence of smokeless tobacco by background characteristics.

3. Analysis and discussion of the results:

In the present study people in the age group 15 years and above with the inclusion criteria are included for data collection. A total of 5203 people are enrolled in the study. Information about their use of smokeless tobacco and different socio-economic characteristics of the enrolled people are collected. The demographic profile of the people selected in the study is presented in the table below:

Table 3.1: Demographic profile of the selected people in the study

Characteristics of the selected people	Frequency (%)
Age (in years)	
15-24	728 (14%)
25-44	3132 (60.2%)
45-64	1243 (23.9%)
65+	1.9%
Total	5203(100%)

Occupation	
Govt./Non-Govt Employee	727(14%)
Self-employed	1659(31.9%)
Unemployed	226(4.3%)
Others	2591(49.8%)
Total	5203(100%)
Education	
More than secondary	948 (18.22%)
Upto secondary	1585 (30.46%)
Upto primary	1576 (30.3%)
No education	1094 (21%)
Total	5203 (100%)
Gender	
Male	2600(50%)
Female	2603 (50%)
Total	5203 (100%)

Table 3.2: Detailed status of use of smokeless tobacco in India and Assam w.r.t. gender

Using Habits	India		Assam	
	Male	Female	Male	Female
Daily user	27.4%	14.9%	31.8%	14.8%
Occasional user	5.4%	3.5%	8.0%	10.5%
Occasional former daily	1.5%	1.2%	1.8%	2.6%
Occasional never daily	4.0%	2.3%	6.2%	7.8%

From the table it is seen that daily male users of smokeless tobacco is more in Assam as compared to national level. It is also seen that occasional male user of smokeless tobacco in Assam is more as compared to national level.

The following figure shows detailed status of use of smokeless tobacco in India and Assam

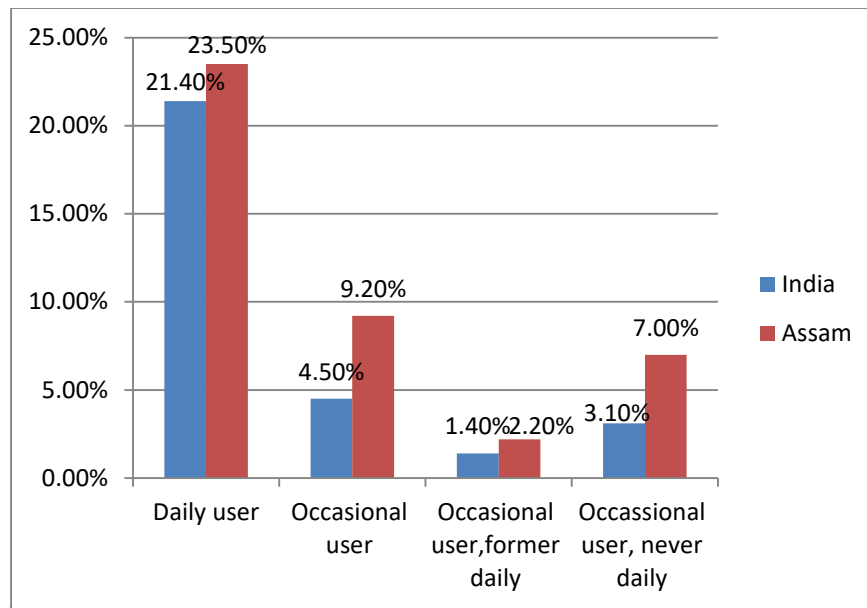


Fig 3.1: Percentage of adults age 15 and above by detailed status of use of smokeless tobacco in India and Assam

From the figure it is seen that majority of the respondents use smokeless tobacco daily. Daily user of smokeless tobacco is highest in Assam as compared to the national level.

The following table shows the detailed status of use of smokeless tobacco in India and Assam w.r.t. gender. The following figure shows the detailed status of initial age of use of smokeless tobacco in India and Assam.

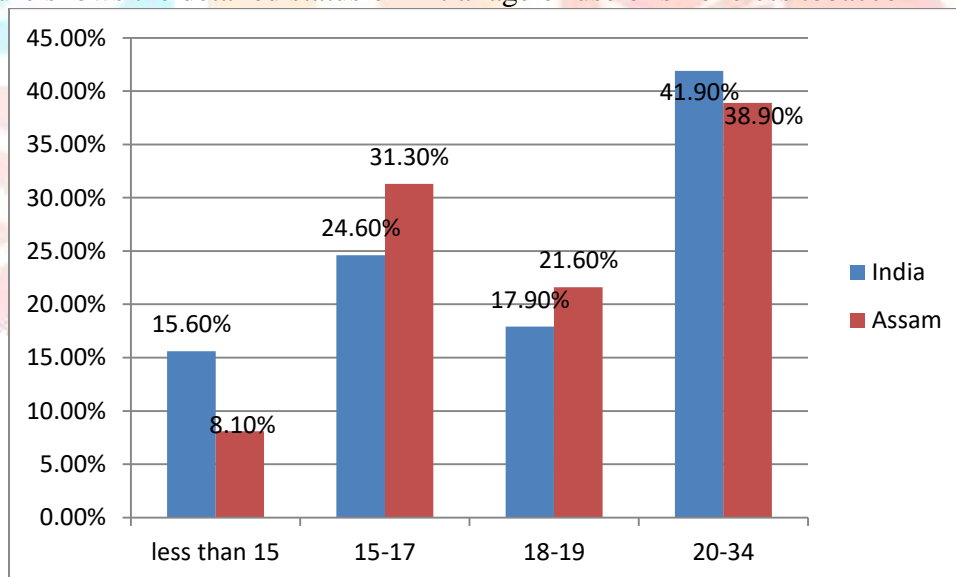


Fig 3.2: Detailed status of initial age of use of smokeless tobacco in India and Assam

Further chi-square test for independence of attributes is used to study the relationship between use of smokeless tobacco with some factors such as age, sex, occupation, educational qualification etc.

Table 3.2: Results of the chi-square test:

Characteristics	Use of smokeless tobacco		χ^2	p-value
	No	Yes		
Gender				
Male	1585 (60.8%)	1020 (39.2%)	121.543	0.0001
Female	1962 (75.1%)	651 (24.9%)		
Age				
15 to 24	141 (77.9%)	40 (22.1%)	25.539	0.0001
24 to 44	979 (63.2%)	571 (36.8%)		
45 to 64	475 (59.1%)	329 (40.9%)		
65 and above	38 (52.8%)	34 (47.2%)		
Occupation				
Govt./Non Govt.			232.614	0.0001
Employee	457 (62.8%)	271 (37.2%)		
Self-employee	994 (59.74%)	670(40.26%)		
Unemployed	149(65.3%)	79(34.6%)		
Others	1947(74.9%)	651(25.05%)		
Education				
More than secondary	376(79.2%)	99(20.8%)	281.370	0.0001
Up to secondary	1104(69.5%)	484(30.5%)		
Up to primary	934(59.1%)	646(40.9%)		
No education	780(71.17%)	316(28.83%)		

From the above table it is seen that males are more prone to use of smokeless tobacco as compared to the female respondents. The result is also found to be statistically significant and we may conclude that there is association between use of smokeless tobacco and gender of the respondents. The **Global Adult Tobacco Survey (GATS)** report shows that the number of male smokeless tobacco users (135.2 million) is almost twice that of female smokeless tobacco users (70.7 million)^[4] in India. It is also observed that less educated people are more prone to use of smokeless tobacco as compared to the educated people. The result is found to be statistically significant and we may conclude that there is association between use of smokeless tobacco and education of the respondents. These findings corroborate the result of GATS in India. The study shows that use of smokeless tobacco is increase along with the age and this result is found to be statistically significant. It is also observed that employed people are more prone to use of smokeless tobacco and the result is found to be statistically significant and we may conclude that there is association between use of smokeless tobacco and occupation of the respondents.

The **Global Adult Tobacco Survey (GATS)** report shows that a quarter (26%) of all adults in India uses smokeless tobacco either by chewing, or applying it to the teeth and gums, or by sniffing^[4]. Use of smokeless tobacco is more prevalent than the smoking version and prevalence of smokeless tobacco use (26%) is far more than prevalence of smoking (14%)^[4]. Among the 26 % of all adults who use smokeless tobacco, 21 % use smokeless tobacco every day and the other 5 % use it occasionally. The extent of use of smokeless tobacco

among males (33%) is higher than females (18%), though the differentials are not as sharp as with prevalence of smoking. In rural areas 29 % of adults use smokeless tobacco whereas in urban areas 18 % used it^[4]. The number of adult current users of smokeless tobacco in India is 206.0 million, which is much higher than the number of current tobacco smokers (111.2 million)^[4]. Similarly, the number of smokeless tobacco users in rural areas (164.9 million) is almost four times that in urban areas (41.0 million)^[4]. The number of daily users of smokeless tobacco is twice the number of daily tobacco smokers^[4]. The prevalence of smokeless tobacco use varies from a high of 38 % in the Eastern region to the low of 7 % in the Northern region. It has been noted that in India as a whole the prevalence of smokeless tobacco is greater than that of smoking^[4]. However, in the North region, the prevalence of smokeless tobacco use is lower than that of smoking, and in the South region the two have similar values. The state/UT level variation in the prevalence of smokeless tobacco use ranges from 49% in Bihar to 5% in Goa^[4]. The Global Adult Tobacco Survey (GATS) report shows that Khaini is the most commonly used smokeless tobacco product followed by gutkha. The prevalence of each of the smokeless tobacco product is higher among male as compared to female^[4]. The proportion of daily users of smokeless tobacco among males increases with age from 17 % in the age group of 15–24 to 33 % in the age group 25–44, but decreases to 29–30 % among males age 45–64 and 65 and above. The prevalence of daily smokers among females increases from 6 % in the age group of 15–24 to 30 % among females age 65 and above. Use of smokeless tobacco is evident even among adolescents age between 15–17 years. Daily use of smokeless tobacco among males and females decreases with the rise in their educational level. 8 percent of male students and 4 percent of female students use smokeless tobacco either daily or occasionally. The mean age of initiation of use of smokeless tobacco is 17.9 years, the same as for initiation of smoking. It is found that 55 % of the users of smokeless tobacco in India purchase it from the store followed by 32 percent from the kiosk and only 10 percent buy from the street vendor^[4]. The gender differential of the users shows that in comparison to males (50%), a higher proportion of females (64%) purchase smokeless tobacco product from the store while more males (37%) visit the kiosk than females (22%) to buy the same product^[4]. On an average, a tobacco user in India spends Rs 11.50, 5.60 and 6.00 for buying cigarettes bides and smokeless tobacco respectively during the last purchase^[4].

4. Conclusion:

GAST-India provides an ample opportunity to study the tobacco use behavior in the form of smoking, smokeless tobacco and dual use of tobacco among adults in India. According to the GATS- reports tobacco is also a part of the socio-cultural milieu in Assam and use of smokeless tobacco is very high in this state. In Assam about 33% adults use smokeless tobacco. Paan (betel quid) with tobacco is the most common and traditional form of using chewable tobacco. The present study reveals that there is significant association between use of smokeless tobacco and age, gender, occupation, education qualification of the respondents.

There is an urgent need to take effective steps, especially on launching community awareness programs for the school children and public to educate them about the consequences of tobacco use, and on assessing their effectiveness in curbing the problem. Tobacco control policies in India should adopt a targeted, population-based approach to control and reduce tobacco consumption in the country. Health warning on use of smokeless tobacco products packages need to be stronger and clear to ensure that the message is effectively conveyed to the target population.

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