Correlates of substance use in Northeast States, India

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ABSTRACT

Background: Substance use is an international problem which affects more or less every country in the world. Despite the increased awareness of injurious effects of substance use, India is a one of the countries with high prevalence of tobacco and alcohol use. Evidence suggests the magnitude of substance use is likely to be higher among Northeast who residing in adverse geographical settings. It states that the increased of substance use in developing nations where health and economic system are weakest is of great concern to WHO. Keeping this in background, the present paper is analyzed patterns and correlates of substance use in Northeast states, India.

Methods: Using information from the fourth round of District Level Household Survey (2012-13). The outcome variables included in the study was substance use (smokeless tobacco, smoke and alcohol consumption). Bivariate and multivariate technique used to determine the difference and understand the net effect of predictor variables on the substance use.

Results: The result shows that substance use was significantly high among the young age group of 25-34 years. The prevalence of substance use was high among male as compared to female and substance use is slightly low among more educated person. Substance use was high in Meghalaya and Mizoram as compared to other northeast states. Factors such as age group, social group, sex, education and economic status of household were significantly associated with substance use in Northeast states, India.

Conclusion: We conclude by this study, the prevalence of substance use in northeast was very high and alarming. There are really an important health concerns and they need to be counseled about the ill effect of substance use. Establishment of de-addiction centers or strong referral to de-addiction centers among those consuming alcohol or other substances might be a novel step for well-being of Northeast people. Government specially, Doctors and media should play their roles and spread information regarding harmful effects of using substance use. In order to control substance use more effectively, state governments should implement the existing national acts of tobacco and alcohol control at the district level.

Key words: Northeast, Substance use, Smokeless tobacco, Smoke, Alcohol consumption, DLHS-4

INTRODUCTION

Substance use is one of the most common causes of preventable human deaths worldwide; alcohol and tobacco are most commonly used substances throughout the world. India has a huge burden of either licit or legal substance use (tobacco and alcohol) as well as illicit substances. The National Household Survey of Drug Use in the country was the first systematic effort to document the nation-wide prevalence of drug use. Alcohol (21.4%) was the primary substance used (apart from tobacco) followed by cannabis (3.0%) and opioids (0.7%) among men. The epidemic of substance abuse in young generation has assumed alarming dimensions in India. Changing cultural values, increasing economic stress and dwindling supportive bonds are leading to initiation into...
substance use. World Health Organization (WHO), defines substance abuse as, persistent or sporadic drug use inconsistent with or unrelated to acceptable medical practice. WHO, estimates that there are about 2 billion people worldwide consuming alcohol beverages and 76.3 million are diagnosed with alcohol related disorders in 1990. Alcohol consumption causes 3.2% of overall human deaths, globally and worldwide 5% of all human deaths were in the age group of 5 to 29 attributed to alcohol use. Studies conducted in different parts of India suggest prevalence rates of use of alcoholic beverages ranging 23% to 74% among males.

Women constitute over 90% of abstainers, though among tribal group there is substantial number of alcohol users with the prevalence rates ranging between 28 to 48%. Studies from late 1970’s and early 1980’s found that 12.7% of high school students, 36.6% of university students and 31.6% of non-student young people are using alcohol beverages. It is also observed that, those who are using alcohol not restricted themselves to single substance use as either alcohol follows the tobacco or tobacco follows the alcohol or any other substance. Smokeless tobacco and smoking is one of the major causes of human deaths due to many medical conditions in the world.

According to WHO estimation, 4.9 million annual deaths are attributed to tobacco use only. This figure expected to rise to 10 million by 2030, out of which 7 million deaths will occur in developing countries, especially China and India. Currently India constitute about one fifth of overall deaths attributed to tobacco use worldwide, more than 8,00,000 people die and 12 million people become ill as a result of tobacco use each year. Deaths attributed to tobacco in India are expected to rise from 1.4% in 1990 to 13.3% in 2020. It is estimated that nearly 5,500 adolescents starts using tobacco every day in India.

| Substance use | Northeast states | Arunanchal Pradesh | Manipur | Meghalaya | Tripura | Nagaland | Sikkim | Mizoram |
|---------------|------------------|--------------------|---------|-----------|---------|----------|--------|---------|
| Smokeless tobacco | Men | 56.9 | 65.2 | 86.7 | 66.6 | 64.2 | 39.3 | 79.2 |
| | Women | 33.7 | 51.7 | 87.2 | 65.8 | 34.5 | 23.6 | 77.4 |
| | Total | 44.7 | 57.9 | 87.0 | 66.2 | 49.3 | 30.9 | 78.3 |
| Smoke | Men | 41.8 | 50.4 | 52.3 | 32.2 | 35.1 | 23.4 | 63.4 |
| | Women | 7.8 | 11.4 | 5.0 | 4.3 | 1.4 | 5.2 | 21.5 |
| | Total | 24.1 | 29.4 | 23.6 | 17.8 | 13.7 | 41.8 |
| Alcohol | Men | 65.4 | 46.7 | 34.4 | 26.8 | 40.0 | 45.3 | 32.6 |
| | Women | 38.0 | 7.1 | 2.4 | 5.5 | 4.5 | 26.0 | 1.9 |
| | Total | 51.0 | 25.4 | 15.0 | 15.8 | 22.2 | 35.1 | 16.8 |

Table 1: Prevalence of substance use by sex in northeast states, India.

Table 1 shows the prevalence of substance abuse in northeast states, India. Results shows that smokeless tobacco were very high in Mizoram as compared to others Northeastern states. However alcohol prevalence were higher in Arunanchal Pradesh as compared to others Northern states.

A limited attempt has been made to understand the prevalence and factors associated with substance use in northeast, states, India.

Thus, the present study is a modest approach in this direction. The paper aims to understand the prevalence, differentials and determinants of substance use in northeast states, India.

METHODS

Study Setting, Survey Data Method and Ethics

Data for this study is taken from the fourth round of the District Level Household Survey (DLHS-4) conducted during 2012-13. DLHS-4 adopted a multi-stage stratified systematic sampling design. Study utilized pooled data for the states namely Sikkim, Arunanchal Pradesh, Nagaland, Manipur, Mizoram, Tripura and Meghalaya. Assam state was not included in the final analytic samples due to unavailable data.

Outcome Measurements

The outcome variable was substance use. Substance use measured by asked the questions about person habit for...
age 15 year and above (smokeless tobacco, smoke and alcohol consumption, separately. The responses of substance use were mainly in five categories for smoke and alcohol; currently users, occasionally users, ex-user, never user and not known.

A person was considered as substance user (smoke and alcohol) if she were consuming substance (smokeless tobacco, smoke and alcohol) currently or occasionally. The responses of substance use were mainly in eight categories for smokeless tobacco; pan with tobacco, pan without tobacco, gutka/pan masala with tobacco, gutka/pan masala without tobacco, tobacco only, ex-chewer, never chewed and not known. The indicator was dichotomized as substance use for smoke and alcohol currently or occasionally users (coded as 1) and ex-user, never user and not known (coded as 0). For smokeless tobacco; ex-chewer, never chewed and not known (coded as 0) and else (coded as 1).

Defining predictor variables

Important Socioeconomic and demographic predictors such as age of person, sex of the person, education of person, occupation of person, religion, social group, wealth quintile, type of residence and state were included as predictor variables in the present study. Further socioeconomic and demographic variables divided in three categories namely individual household and community characteristics.

Individual characteristics included in the analysis were age of person was measured as a continuous variable and categorized into five categories: age group 15-24 years, age group 25-34 years, age group 35-44 years, age group 45-59 and age group 60 and above years. Sex of person as male and female.

Education of person were grouped into four categories: illiterate and below primary, primary but below middle, middle but below high school and high school and above. Occupation of the person was categorized into two categories: Not working and working.

Household characteristics included in the analysis were religion grouped into three categories: Hindu, Crisian and Others. Identification of the social group was categorized into four categories: Scheduled Tribes (STs), Scheduled Castes (SCs), other backward class and other (General).

Similarly, Household wealth index was also calculated from the standard set of assets owned by the household, which included ownership of consumer items and dwelling characteristics. Individuals were ranked on the basis of their household scores and divided into different quintiles, each representing 20 percent of the score, between 1 (poorest) and 5 (wealthiest)\(^{12}\) and the index has been found to correlate highly with income data in developing countries.\(^{3,14}\) However wealth index was categorized into the five categories: poorest, poorer, richer, and richest.

Community characteristics included in analysis were place of residence as rural and urban. Since a significant state-level difference found in substance user (DLHS-4 fact sheet) along with variations in socioeconomic status across states, this study included state in the predictor’s variables (Sikkim, Arunanchal Pradesh, Nagaland, Manipur, Mizoram, Tripura and Meghalaya).

Analytical approach

To identify levels, differentials and determinants of Substance use, present study used both bivariate and multivariate analyses. Chi-square test is used to determine the difference in proportions of the substance use across selected individual, household and community background characteristics. Binary logistic regression is applied to understand the net effect of predictor variables on the substance use.

We have chosen logistic regression because the response variables in our study are of dichotomous (i.e., binary) nature. Only those predictor variables that are found significant in chi-square test are included in the final binary logistic regression model. The results of logistic regression are presented in the form of estimated odds-ratios with 95% CI. The whole analysis was performed using STATA version 13.0 to take into account the survey design (i.e. sampling weights with clustering and strata).

Ethical statement

The study is based on data available in public domain; therefore no ethical issue is involved.

RESULTS

Background characteristics of the women

Table 2 represents the weighted percent distribution of person by selected individual, household and community characteristics. Among the persons, more than one forth (22.4%) were youth between age 15-24 while almost same person were in the age group 25-34 years (23.7%). Almost (12.5%) person were age 60 years and above. Among the person, more than half (52.8%) were male and among them more than half (58.2%) were not working. Majority (58.0%) of the person belongs to christian religion and among them majority (80.5%) of person belong to Scheduled tribes social group. More than two third (67.9%) person belonged to rural areas.
Table 2: Percent distribution of respondent by selected individual, household and community characteristics in northeast states, India, DLHS-4 (2012-13).

| Background characteristics | Sample | Weighted proportion | 95% CI       |
|----------------------------|--------|---------------------|--------------|
| **Individuals characteristics** |        |                     |              |
| Age                        |        |                     |              |
| 15-24                      | 31893  | 22.4                | [21.9-23.0]  |
| 25-34                      | 34054  | 23.7                | [23.4-24.0]  |
| 35-44                      | 27501  | 19.2                | [18.9-19.5]  |
| 45-59                      | 31930  | 22.1                | [21.7-22.5]  |
| 60 and above               | 18336  | 12.5                | [11.9-13.2]  |
| Sex                        |        |                     |              |
| Male                       | 67939  | 47.2                | [46.9-52.2]  |
| Female                     | 75805  | 52.8                | [52.6-58.4]  |
| Marital status             |        |                     |              |
| Never married              | 35355  | 25.1                | [24.3-28.5]  |
| Currently married          | 96053  | 66.3                | [65.6-73.7]  |
| Others                     | 12288  | 8.6                 | [8.3-9.7]    |
| Education                  |        |                     |              |
| Illiterate                 | 33426  | 22.3                | [21.0-23.7]  |
| Literate and below primary | 18329  | 12.3                | [11.8-12.9]  |
| Primary but below middle   | 23118  | 15.8                | [15.5-16.2]  |
| Middle but below high school| 26037  | 18.3                | [17.9-18.7]  |
| High school and above      | 42449  | 31.3                | [29.6-33.0]  |
| Occupation                 |        |                     |              |
| Not working                | 82444  | 58.2                | [57.5-58.9]  |
| Working                    | 59932  | 41.8                | [41.1-42.5]  |
| Household characteristics   |        |                     |              |
| Religion                   |        |                     |              |
| Hindu                      | 32799  | 23.8                | [22.3-27.8]  |
| Christian                  | 84178  | 58.0                | [56.9-65.1]  |
| Others                     | 26691  | 18.2                | [16.8-21.7]  |
| Caste                      |        |                     |              |
| Scheduled tribes           | 108621 | 80.5                | [78.9-90.3]  |
| Scheduled castes           | 8133   | 6.4                 | [5.6-08.0]   |
| Other backward classes     | 8631   | 6.6                 | [6.1-07.8]   |
| Others                     | 8072   | 6.5                 | [5.6-08.2]   |
| Wealth quintile            |        |                     |              |
| Poorest                    | 28750  | 18.9                | [17.4-20.5]  |
| Poorer                     | 28749  | 19.1                | [18.2-20.1]  |
| Middle                     | 28750  | 19.8                | [19.2-20.4]  |
| Richer                     | 28749  | 20.3                | [19.4-21.2]  |
| Richest                    | 28749  | 21.9                | [20.1-23.8]  |
| Community characteristics   |        |                     |              |
| Type of locality           |        |                     |              |
| Rural                      | 107474 | 67.9                | [55.6-86.0]  |
| Urban                      | 36273  | 32.1                | [21.8-48.8]  |
| State                      |        |                     |              |
| Sikkim                     | 10166  | 7.0                 | [6.7-08.0]   |
| Arunanchal Pradesh         | 36912  | 25.4                | [24.4-29.2]  |
| Nagaland                   | 28914  | 20.1                | [19.3-23.2]  |
| Manipur                    | 23148  | 16.2                | [15.7-18.3]  |
| Mizoram                    | 24030  | 16.9                | [16.3-19.3]  |
| Tripura                    | 6746   | 4.7                 | [4.2-05.8]   |
| Meghalaya                  | 13831  | 9.7                 | [9.3-11.1]   |
| Total                      | 143747 | 100.0               |              |

The total may not be equal due to some missing cases
Table 3: Weighted percent distribution of respondents by types of substance use by selected individual, household and community characteristics of person in northeast states, India, DLHS-4 (2012-13).

| Background characteristics | Smokeless | Smoke | Substance use | Alcohol | Any use | All use | n |
|----------------------------|-----------|-------|---------------|---------|---------|---------|---|
| **Individuals characteristics** |           |       |               |         |         |         |   |
| Age                        | $\chi^2=4298.940^{***}$ | $\chi^2=2418.607^{***}$ | $\chi^2=2825.639^{***}$ | $\chi^2=5357.820^{***}$ | $\chi^2=1666.398^{***}$ |       |   |
| 15-24                      | 44.8      | 15.5  | 18.7          | 51.2    | 0.85    | 3189    |   |
| 25-34                      | 63.4      | 27.2  | 32.8          | 72.0    | 16.9    | 34054   |   |
| 35-44                      | 65.8      | 29.9  | 35.0          | 74.4    | 18.1    | 27501   |   |
| 45-59                      | 62.8      | 30.5  | 33.3          | 72.4    | 16.6    | 31930   |   |
| 60 and above               | 48.8      | 26.7  | 24.6          | 61.1    | 11.1    | 18336   |   |
| **Sex**                    |           |       |               |         |         |         |   |
| Male                       | 65.4      | 44.8  | 45.7          | 76.1    | 27.6    | 67939   |   |
| Female                     | 50.8      | 8.8   | 14.3          | 57.9    | 2.7     | 75805   |   |
| **Marital status**         |           |       |               |         |         |         |   |
| Never married              | 48.9      | 20.5  | 22.0          | 55.1    | 11.8    | 35535   |   |
| Currently married          | 61.3      | 28.1  | 32.4          | 70.6    | 16.1    | 96053   |   |
| Others                     | 55.9      | 23.5  | 25.0          | 67.9    | 9.7     | 12288   |   |
| **Education**              |           |       |               |         |         |         |   |
| Illiterate                 | 54.4      | 24.7  | 36.2          | 68.0    | 14.3    | 33426   |   |
| Literate and below primary | 62.7      | 29.3  | 25.8          | 70.7    | 14.1    | 18329   |   |
| Primary but below middle   | 58.9      | 26.4  | 26.7          | 66.6    | 14.0    | 23118   |   |
| Middle but below high school| 58.1     | 25.2  | 26.4          | 64.6    | 14.6    | 26037   |   |
| High school and above      | 57.5      | 25.3  | 28.4          | 65.1    | 15.0    | 42449   |   |
| **Occupation**             |           |       |               |         |         |         |   |
| Not working                | 50.7      | 16.2  | 20.2          | 58.3    | 8.0     | 82444   |   |
| Working                    | 67.3      | 39.2  | 41.8          | 77.9    | 23.4    | 59932   |   |
| **Household characteristics** |           |       |               |         |         |         |   |
| Religion                   |           |       |               |         |         |         |   |
| Hindu                      | 54.9      | 22.4  | 31.0          | 63.9    | 14.0    | 32799   |   |
| Christian                  | 62.5      | 27.3  | 23.2          | 67.7    | 14.3    | 84178   |   |
| Others                     | 46.1      | 25.2  | 45.6          | 66.0    | 15.7    | 26691   |   |
| **Caste**                  |           |       |               |         |         |         |   |
| Scheduled tribes           | 58.9      | 27.1  | 30.3          | 68.2    | 14.9    | 108621  |   |
| Scheduled castes           | 55.4      | 20.9  | 25.8          | 62.0    | 12.6    | 8133    |   |
| Other backward classes     | 48.4      | 21.1  | 25.2          | 58.2    | 10.6    | 8631    |   |
| Others                     | 54.3      | 21.8  | 25.8          | 61.6    | 13.4    | 8072    |   |
| **Wealth quintile**        |           |       |               |         |         |         |   |
| Poorest                    | 59.5      | 28.9  | 34.3          | 69.6    | 17.2    | 28750   |   |
| Poorer                     | 58.8      | 26.9  | 31.0          | 67.3    | 16.3    | 28749   |   |
| Middle                     | 53.3      | 22.9  | 30.8          | 63.6    | 13.1    | 28750   |   |
| Richer                     | 57.1      | 24.5  | 27.8          | 65.4    | 13.8    | 28749   |   |
| Richest                    | 59.7      | 25.7  | 22.8          | 66.8    | 12.4    | 28749   |   |
| **Community characteristics** |           |       |               |         |         |         |   |
| Type of locality           |           |       |               |         |         |         |   |
| Rural                      | 56.9      | 26.2  | 31.9          | 66.9    | 15.2    | 107474  |   |
| Urban                      | 59.4      | 24.9  | 23.3          | 65.7    | 12.9    | 36273   |   |
| **State**                  |           |       |               |         |         |         |   |
| Sikkim                     | 31.0      | 13.8  | 35.2          | 47.9    | 7.0     | 10166   |   |
| Arunachal Pradesh           | 44.9      | 24.2  | 51.3          | 63.8    | 17.5    | 36912   |   |
| Nagaland                   | 49.4      | 18.2  | 22.2          | 52.8    | 12.4    | 28914   |   |
| Manipur                    | 58.1      | 29.5  | 25.4          | 65.1    | 17.8    | 23148   |   |
| Mizoram                    | 78.4      | 41.8  | 16.8          | 82.4    | 14.6    | 24030   |   |
| Tripura                    | 66.2      | 17.8  | 15.9          | 70.5    | 8.4     | 6746    |   |
| Meghalaya                  | 87.1      | 23.6  | 15.0          | 88.3    | 13.0    | 13831   |   |
| Total                      | 57.7      | 25.8  | 29.1          | 66.5    | 14.5    | 143747  |   |
Table 4: Binary logistic regression models to examine the effect of individuals household and community characteristics on substance use (smokeless smoke and alcohol) in North-East states, India, DLHS-4 (2012-13).

| Background characteristics | Substance use | Smokeless | Smoke | Alcohol |
|----------------------------|---------------|-----------|-------|---------|
|                            | Odds ratio    | 95% CI    | Odds ratio | 95% CI | Odds ratio | 95% CI |
| Individuals characteristics |               |           |           |         |           |       |
| Age                        |               |           |           |         |           |       |
| 15-24 (ref)                | 1.000         | 1.000     | 1.000     |         |           |       |
| 25-34                      | 1.834***      | [1.741-1.933] | 1.972*** | [1.866-2.084] | 2.083*** | [1.951-2.224] |
| 35-44                      | 1.845***      | [1.718-1.982] | 1.984*** | [1.852-2.126] | 1.977*** | [1.839-2.126] |
| 45-59                      | 1.511***      | [1.397-1.635] | 1.831*** | [1.703-1.968] | 1.587*** | [1.464-1.720] |
| 60 and above               | 0.790***      | [0.727-0.858] | 1.204*** | [1.112-1.302] | 0.832*** | [0.761-0.911] |
| Sex                        |               |           |           |         |           |       |
| Male (ref)                 | 1.000         | 1.000     | 1.000     |         |           |       |
| Female                     | 0.482***      | [0.463-0.502] | 0.101*** | [0.096-0.107] | 0.150*** | [0.143-0.158] |
| Marital status             |               |           |           |         |           |       |
| Currently married          | 1.560***      | [1.475-1.648] | 1.240*** | [1.180-1.322] | 1.394*** | [1.308-1.484] |
| Others                     | 1.501***      | [1.391-1.619] | 1.468*** | [1.343-1.604] | 1.573*** | [1.439-1.721] |
| Education                  |               |           |           |         |           |       |
| Illiterate (ref)           | 1.000         | 1.000     | 1.000     |         |           |       |
| Literate and below primary | 0.988         | [0.927-1.053] | 0.909*** | [0.853-0.970] | 0.715*** | [0.664-0.770] |
| Primary but below middle   | 0.939***      | [0.893-0.989] | 0.808*** | [0.761-0.857] | 0.677*** | [0.631-0.727] |
| Middle but below high school | 0.943***     | [0.901-0.986] | 0.748*** | [0.698-0.802] | 0.669*** | [0.622-0.719] |
| High school and above      | 0.946**       | [0.892-1.002] | 0.713*** | [0.673-0.756] | 0.711*** | [0.670-0.755] |
| Occupation                 |               |           |           |         |           |       |
| Not working (ref)          | 1.000         | 1.000     | 1.000     |         |           |       |
| Working                    | 1.329***      | [1.267-1.394] | 1.303*** | [1.241-1.379] | 1.311*** | [1.249-1.376] |
| Household characteristics  |               |           |           |         |           |       |
| Religion                   |               |           |           |         |           |       |
| Hindu (ref)                | 1.000         | 1.000     | 1.000     |         |           |       |
| Christian                  | 0.766***      | [0.669-0.877] | 0.755*** | [0.655-0.869] | 0.471*** | [0.411-0.541] |
| Others                     | 0.663***      | [0.591-0.744] | 0.826*** | [0.741-0.922] | 0.895** | [0.797-1.006] |
| Caste                      |               |           |           |         |           |       |
| Scheduled tribes (ref)     | 1.000         | 1.000     | 1.000     |         |           |       |
| Scheduled castes           | 0.848*        | [0.719-1.001] | 0.657*** | [0.571-0.756] | 0.420*** | [0.363-0.486] |
| Other backward classes     | 0.822***      | [0.730-0.927] | 0.692*** | [0.600-0.798] | 0.343*** | [0.301-0.390] |
| Others                     | 0.912         | [0.810-1.028] | 0.661*** | [0.577-0.755] | 0.416*** | [0.346-0.500] |
| Wealth quintile            |               |           |           |         |           |       |
| Poorest (ref)              | 1.000         | 1.000     | 1.000     |         |           |       |
| Poorer                     | 1.063*        | [0.996-1.134] | 1.006    | [0.944-1.073] | 0.997    | [0.934-1.063] |
| Middle                     | 0.944         | [0.876-1.017] | 0.896*** | [0.837-0.959] | 0.927** | [0.867-0.991] |
| Richer                     | 1.030         | [0.953-1.113] | 0.923**  | [0.851-1.000] | 0.940*  | [0.881-1.003] |
| Richest                    | 0.960         | [0.887-1.039] | 0.823*** | [0.755-0.897] | 0.860*** | [0.788-0.939] |
| Community characteristics  |               |           |           |         |           |       |
| Type of locality           |               |           |           |         |           |       |
| Rural (ref)                | 1.000         | 1.000     | 1.000     |         |           |       |
| Urban                      | 1.006         | [0.915-1.105] | 0.936** | [0.884-0.990] | 0.983    | [0.915-1.057] |
| State                      |               |           |           |         |           |       |
| Sikkim (ref)               | 1.000         | 1.000     | 1.000     |         |           |       |
| Arunachal Pradesh          | 1.763***      | [1.515-2.051] | 1.975*** | [1.702-2.291] | 1.754*** | [1.565-1.967] |
| Nagaland                   | 2.332***      | [1.959-2.776] | 1.387*** | [1.152-1.671] | 0.516*** | [0.455-0.584] |
| Manipur                    | 3.077***      | [2.604-3.636] | 3.793*** | [3.209-4.483] | 0.753*** | [0.639-0.889] |
| Mizoram                    | 9.543***      | [7.768-11.724] | 7.024*** | [5.777-8.531] | 0.333*** | [0.287-0.387] |
| Tripura                    | 4.403***      | [3.532-5.488] | 1.460*** | [1.179-1.808] | 0.297*** | [0.241-0.367] |
| Meghalaya                  | 21.493***     | [9.737-16.602] | 2.703*** | [2.147-3.402] | 0.325*** | [0.271-0.389] |
Table 5: Binary logistic regression models to examine the effect of individuals household and community characteristics on substance use (all substance and any substance use) in North-East states, India, DLHS-4 (2012-13).

| Background characteristics | Substance use | Any substance use | All substance use |
|----------------------------|---------------|-------------------|-------------------|
|                            |               | Odds ratio        | 95% CI            | Odds ratio        | 95% CI            |
| Individuals characteristics |               |                   |                   |                   |                   |
| Age                        |               |                   |                   |                   |                   |
| 15-24 (ref)                | 1.000         |                   |                   | 1.000             |                   |
| 25-34                      | 2.033***      | [1.932-2.139]     | 1.990***          | [1.838-2.155]     |
| 35-44                      | 2.027***      | [1.885-2.179]     | 1.831***          | [1.657-2.022]     |
| 45-59                      | 1.690***      | [1.557-1.834]     | 1.398***          | [1.265-1.545]     |
| 60 and above               | 0.925**       | [0.850-1.008]     | 0.717***          | [0.647-0.795]     |
| Sex                        |               |                   |                   |                   |                   |
| Male (ref)                 | 1.000         |                   |                   | 1.000             |                   |
| Female                     | 0.376***      | [0.362-0.391]     | 0.069***          | [0.062-0.076]     |
| Marital status             |               |                   |                   |                   |                   |
| Never married (ref)        | 1.000         |                   |                   | 1.000             |                   |
| Currently married          | 1.703***      | [1.611-1.801]     | 1.209***          | [1.133-1.291]     |
| Others                     | 1.816***      | [1.680-1.963]     | 1.234***          | [1.112-1.370]     |
| Education                  |               |                   |                   |                   |                   |
| Illiterate (ref)           | 1.000         |                   | 1.000             |                   |
| Literate and below primary | 0.930***      | [0.870-0.994]     | 0.788***          | [0.726-0.854]     |
| Primary but below middle   | 0.869***      | [0.824-0.915]     | 0.724***          | [0.668-0.786]     |
| Middle but below high school| 0.836***     | [0.786-0.888]     | 0.733***          | [0.684-0.785]     |
| High school and above      | 0.874***      | [0.825-0.927]     | 0.690***          | [0.639-0.744]     |
| Occupation                 |               |                   |                   |                   |                   |
| Not working (ref)          | 1.000         |                   | 1.000             |                   |
| Working                    | 1.410***      | [1.340-1.483]     | 1.338***          | [1.255-1.426]     |
| Household characteristics  |               |                   |                   |                   |                   |
| Religion                   |               |                   |                   |                   |                   |
| Hindu (ref)                | 1.000         |                   |                   | 1.000             |                   |
| Christian                  | 0.595***      | [0.527-0.673]     | 0.697***          | [0.595-0.816]     |
| Others                     | 0.848***      | [0.750-0.959]     | 0.762***          | [0.668-0.868]     |
| Caste                      |               |                   |                   |                   |                   |
| Scheduled tribes (ref)     | 1.000         |                   | 1.000             |                   |
| Scheduled castes           | 0.599***      | [0.501-0.716]     | 0.631***          | [0.530-0.751]     |
| Other backward classes     | 0.607***      | [0.542-0.680]     | 0.525***          | [0.442-0.623]     |
| Others                     | 0.639***      | [0.563-0.726]     | 0.663***          | [0.557-0.788]     |
| Wealth quintile            |               |                   |                   |                   |                   |
| Poorest (ref)              | 1.000         |                   | 1.000             |                   |
| Poorer                     | 1.057         | [0.987-1.133]     | 1.017             | [0.952-1.087]     |
| Middle                     | 0.965         | [0.893-1.042]     | 0.848***          | [0.788-0.912]     |
| Richer                     | 1.029         | [0.957-1.108]     | 0.918***          | [0.855-0.986]     |
| Richest                    | 0.941         | [0.870-1.017]     | 0.870***          | [0.795-0.953]     |
| Community characteristics  |               |                   |                   |                   |                   |
| Type of locality           |               |                   |                   |                   |                   |
| Rural (ref)                | 1.000         |                   | 1.000             |                   |
| Urban                      | 0.970         | [0.895-1.051]     | 1.024             | [0.945-1.108]     |
| State                      |               |                   |                   |                   |                   |
| Sikkim (ref)               | 1.000         |                   | 1.000             |                   |
| Arunanchal Pradesh         | 1.830***      | [1.613-2.077]     | 2.605***          | [2.146-3.162]     |
| Nagaland                   | 1.436***      | [1.233-1.671]     | 1.923***          | [1.537-2.407]     |
| Manipur                    | 2.398***      | [2.135-2.694]     | 3.708***          | [2.962-4.643]     |
| Mizoram                    | 6.950***      | [5.806-8.319]     | 2.590***          | [1.895-3.015]     |
| Tripura                    | 3.023***      | [2.472-3.696]     | 1.187             | [0.885-1.591]     |
| Meghalaya                  | 14.153***     | [10.987-18.230]   | 2.442***          | [1.875-3.182]     |


**Differentials in substance use**

To identify the prevalence and differentials of substance use, the study examined bivariate differential of the selected individual, household and community characteristics. Table 3 shows the weighted percentage of substance use by selected individual, household and community characteristics. Results indicate that the younger age groups 25-44 years were consuming more all form of substance use as compared to youth and older age group. Male were consuming more substance as compared to female. Currently married person were consuming more all form of substance use than never married. As expected illiterate person consuming more alcohol as compared to literate person. People who have some disposable income in hand that is the working person consuming more substances as compared to people who were not working. As regards to religion results shows that the person belongs to Christian religion were consuming more smokeless tobacco as compared to Hindu and others religion. However person belongs to others religion were consuming more alcohol than Hindu and Christian. Person belongs to scheduled tribes social group were consuming more substances than others backward class and others social group. Poor people (poorest wealth quintile) were consuming more alcohol as compared to rich (richest wealth quintile). Rural people were consuming more alcohol as compared to their counterpart urban people. Almost half of the person from Arunanchal Pradesh were consuming alcohol, followed by Sikkim (35.2%), Manipur (25.4%). However people from Meghalaya were using more smokeless tobacco as compared to others Northeast states. This study also revealed that Mizoram, the highest prevalence of smoking.

Table 4 presents the results of the logistic regression models to examine the effect of individuals, household and community characteristics on substance use (any substance and all substance) among Northeast states, India. The results show that age group, social group, sex, education and economic status were significantly associated with substance use in Northeast states, India. Age of the person showed the strongest relationship with substance use. Person with younger age group 25-44 years were 2 times more probability to consume substance use as compared to youth age group 15-24 years. Education of the person also showed the strongest relationship with substance use. With the increases the education, the substance use is decreases. As compared to male, female have less chances to consume substance use. Working person has higher chances to substance use than person with not working. The results of logistic regression analysis showed that person belongs to scheduled caste, others backward caste, and others social group were less likely to consume substances as compared to scheduled tribes social group person.

**Determinants of substance**

Table 5 presents the results of the logistic regression models to examine the effect of individuals, household and community characteristics on substance use (any substance and all substance) among Northeast states, India. Results indicated that younger person with age group 25-44 years were almost 2 times higher chances to consume any substances and almost similar trends were showing in case of all substances use. Female were less probability to consume substances as compared to male. Finding shows that educated person were less chances to consume substances as compared to illiterate. Working person were more chances to consume substances than not working person. Scheduled caste, others backward caste and others caste were less probability to consume substance as compared to scheduled tribe’s caste.

**DISCUSSION**

This study highlights the prevalence and determinants of substance use (smokeless tobacco, smoke and alcohol) among Northeast, India. Prevalence of substance use was higher among younger age group as compared to youth and older. Similar findings were reported in others studies. Results from this study indicated that males are consuming more substances than females. These may relate to their risk taking behavior. Educational status was strongly associated with substance use. Finding of this study shows that the educational status increases substance use decreases which documented in several others studies. Results also indicated that the rich person were less chances to consume substances as compared to poor person. Poor or less educated people consume more substances Education emerged as a relatively stronger predictor than economic status of household, both among men and women. It is likely that poor and less educated people are less aware of the health hazards of substance use which indicated in earlier study. There is no significant association was observed between urban and rural residence and substance use. Scheduled tribes castes were more likely to consume substances compared to the obc, and others castes. Compared to christian and others religion, hindu was more likely to consume substances.

**CONCLUSION**

This study concludes that, the prevalence of substance use among northeast, states was very high. The main reasons for high prevalence of substance use were substance use by younger age group, sex of person, economic status, social group and lower educational status. Younger people are most important group of income of family and society and they are easily influenced by habits and behaviors of substance use. Therefore the information regarding the harmful effect of substance use should be targeted towards younger age group. As smokeless tobacco, smoke and alcohol use is very high among scheduled tribes population,
strengthening of IEC activities among Scheduled tribes regarding substance use and its consequences are necessary to minimize the effect. Government should take up initiative and incorporate the problem and the adverse health effects of substance use. There is also a need to advocate for the replacement of dangerous and harmful effects of substances use. This study recommended that the policy needs to include health education about substance use and its adverse effects, management of substance use incidents, communication among the person, specially who residing in adverse geographical areas in Northeast, India.

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