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# A Statistical Study on Reproductive Health and Fertility of Scheduled Tribe and Non-Scheduled Tribe Women in Kokrajhar District, Assam

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**ABSTRACT:** **Background**: Reproductive health is a state of complete physical, mental and social well-being in all matters relating to the reproductive system. Despite efforts at many levels, improving the accessibility of health care and improving the quality of health care for women, is challenging. The present study attempts to analyse the reproductive health of scheduled tribe and non- scheduled tribe women in Kokrajhar district of Assam.

**Methods**: In order to examine the factors related to reproductive health care services statistical tool such as chi square test, multivariate regression analysis and Poisson regression models for children ever born.

**Key Findings**: Chi-square test confirms that women's educational level, abortion, afford medicine and habit of drinking alcohol, chewing tobacco have a significant association with the number of children of scheduled tribe women. Knowledge about Family Planning Programme (FPP), use of contraceptives, treatment satisfaction and afford medicine have a significant association with the number of children of non-scheduled tribe women. By applying Poisson regression model it is observed that the factors age at marriage of women, gynecological complications, afford medicine reduces fertility of scheduled tribe women and knowledge about Family Planning Programme (FPP), contraceptives practices, gynecological complications, physical problem, treatment satisfaction reduces fertility of non-scheduled tribe women.

**Conclusion**: The similar composite scores therefore concealed important differences in health-related behavior among scheduled tribe and non-scheduled tribe. District reproductive health planning should supplement composite indicators with component-level monitoring and community-specific interventions.

## 1. INTRODUCTION

One of the important components of a person's overall health condition is their reproductive health. Reproductive health comprises the capacity to make educated decisions about having children and to receive the proper care, as well as physical, mental, and social well-being in issues pertaining to the reproductive system. This rights-based strategy was adopted during the 1994 International Conference on Population and Development, which also redirected policy focus from fertility control to safe motherhood, reproductive choice, and care access (United Nations, 1995)[4]. Health depends on our capacity to comprehend and control the biological needs to successfully combat the current circumstances. The determinants of health are thought to be individuals, families, communities, and societies, all of which are influenced by different variables. The most explicatory definition was given by Gochman (1982), who defined reproductive health as: those individual characteristics,

including beliefs, expectations, motives, values, perceptions, and other cognitive elements; personality, including effective and emotional states and traits; and overt behaviour patterns, actions, and habits that are related to maintaining, restoring, and improving health [8]. Women from Scheduled Tribe communities often encounter geographic isolation, poverty, limited health infrastructure and lower educational attainment. The Expert Committee on Tribal Health in India called for locally responsive health systems after finding ongoing disparities in outcomes and access among tribal groups (Ministry of Health and Family Welfare and Ministry of Tribal Affairs, 2018). State averages can therefore conceal district-level and community-level differences [24]. Reproductive health is essentially a combination of biological and socio-economic factors, as well as the effectiveness of the delivery system and how well its responsiveness to women's need on the other.

The Kokrajhar district provides key circumstances for comparing women from Scheduled tribe and Non-Scheduled Tribe who reside in the same geographical area. The present study assesses whether the two groups differ in reproductive health factors associated with children ever born.

## 2. REVIEW OF LITERATURE

Agyeman, A. (2021), the findings shows that factors that influence women's fertility levels are age at first marriage, educational attainment, household affluence, place of residence, use of contraceptives, and use of a bank account ownership [1]. Negi, et al. (2010), conducted a study on the prenatal care of tribal and non-tribal women in Chhattisgarh and Jharkhand. According to the data analysis, tribal women are less likely than non-tribal women to have access to and use public health care [6]. Hazarika and Sengupta (2021), Kaibartas of Assam should be attentive to the mother's medical needs in order to improve her health. Pregnant women who are illiterate or have less education are more likely to experience health issues. The utilisation of prenatal care services may be restricted by a lack of knowledge and awareness of issues [9]. Chattopadhyay and Kuri (2018), women's reproductive health is found to be significantly influenced by caste, religion, mother education, and financial assistance from government [12]. Gogoi (2020), the study demonstrates that lack adequate awareness of tea garden women of Assam their reproductive health and the complexity of reproductive health. It also shows that the tea garden women's use of contraceptives and family planning methods is significantly low as a result of their lack of knowledge and awareness [13]. Lavanya and Muniswamy (2024), the results demonstrate that the women's reproductive ages, marital status, and fertility preference were all significant determinants, and the Poisson regression model was determined to be the best-fitted model. Therefore, the wealthiest women should be informed about the advantages of having more children, which contribute to boost fertility, and women should be encouraged to utilise LPG fuel for cooking and delivery at private or public facilities [15]. Pandit and Ravi (2017), the present study identified that the primary health center is only accessible close to their home, according to the current study's economic analysis of the reproductive health condition of Soliga tribe women. Therefore, access to the government hospital with all of its amenities is required. Additionally, the study found that the public health sector's service quality has to be improved [22]. Sharma, (2018), the modern techniques available in the health markets have been accepted by the tribes of Lahaul, Spiti, and Chamba. The customs are progressively disappearing and people are no longer aware of them. Menstrual and unintended pregnancy issues are not treated with herbs or traditional methods. People are aware of the government's policies and initiatives and have embraced all of society's contemporary practices [25]. Srinivasan and Ilango (2010), studied the reproductive healthcare of tribal women in Kolli Hills in Namakkal District, Tamil Nadu and find out gaps in knowledge surrounding the health of tribal women and may build a plan of action for improving their reproductive health [26]. Basu, (1993), in terms of sex ratio, age at marriage, fertility, mortality, life expectancy, and other factors, tribal women's health is found to be inferior than that of Indian women generally in the majority of these areas [27].

In light of the foregoing context, this study aims to investigate the factors associated with the reproductive health of scheduled tribe and non-scheduled tribe women in the Kokrajhar district of Assam.

## 3. OBJECTIVES

The specific objectives of this study are:

1. To examine the reproductive health status of scheduled tribe and non- scheduled tribe women.

2. To examine the factors affecting the reproductive health among scheduled tribe and non- scheduled tribe women.

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## 4. MATERIALS AND METHODS

The sampling design adopted for the present study is purposive stratified random sampling. The study used a cross-sectional design and primary survey data from ever-married women residing in Kokrajhar district, Assam. The research utilized purposive stratified random sampling method for the present study. Cross-sectional design was implemented, and primary survey data was collected from ever-married women living in the Kokrajhar district of Assam. The analytical sample comprised 500 respondents: 250 Scheduled Tribe women and 250 Non Scheduled Tribe women. A structured interview schedule collected demographic, fertility, maternal healthcare, health and socioeconomic information. Children ever born were the outcome for regression analysis. Explanatory variables included the age at marriage of woman, educational level of women, drinking-water source, gynaecological complications, physical health problems, satisfaction with treatment, ability to afford medicines, alcohol or tobacco use and health-insurance coverage. Statistical tool such as Chi square test, Multiple Regression Analysis and Poisson regression has been used for the analysis. Quantitative data is analysed using SPSS 25.00 Version.

### 4.1 Poisson Regression Model

The Poisson Regression model was found to be a suitable model to predict the prevalence of CEB among the scheduled tribe and non-scheduled tribe women in Kokrajhar district because the number of children ever born (CEB), which is regarded as a discrete variable, is a count outcome within the population.

Let $Y_i$ represent the $i^{th}$ scheduled tribal women's number of children ever born (CEB). We assume that $Y_i$ has a Poisson distribution with mean $\lambda_i$ (mean number of children ever born) since the data are in terms of counts. Hence, the probability of observing any specific count $Y_i$ is given by:

$$P(Y_i = y_i) = \frac{e^{-\lambda i}\lambda i^{yi}}{y_i!} \qquad y_i = 0, 1, 2, \ldots. \quad \lambda_i > 0$$

We postulate that the mean value $\lambda_i$ depends on a set of predictors $x_1, x_2, \ldots x_p$

such that

$$Log(\lambda_i) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots. + \beta_p X_p$$

Or

$$\lambda_i = e^{\beta 0 + \beta 1 X1 + \beta 2 X2 + \ldots. + \beta p Xp}$$

Operational Definition and Coding of Variables

| Variable | Type of variable | Characteristics | Codes | Scale |
|---|---|---|---|---|
| Children ever born | Response variable | One birth | 0 | Nominal |
| | | Two births | 1 | |
| | | Three & more births | 2 | |
| Age at marriage of Women (in years) | Explanatory variable | 15-19<br>20-24<br>25-29<br>30-34 | 0<br>1<br>2<br>3 | Ordinal |
| Women's Educational level | Explanatory variable | Illiterate<br>Primary<br>Middle school<br>HSLC<br>HS<br>Graduate & above | 0<br>1<br>2<br>3<br>4<br>5 | Nominal |
| Knowledge about FPP | Explanatory variable | Yes<br>No | 0<br>1 | Nominal |

| | | | | |
|---|---|---|---|---|
| Use of contraceptives | Explanatory variable | Yes<br>No | 0<br>1 | Nominal |
| Abortion | Explanatory variable | Yes<br>No | 0<br>1 | Nominal |
| Gynaecological complications | Explanatory variable | Yes<br>No | 0<br>1 | Nominal |
| Treatment satisfaction | Explanatory variable | Satisfied<br>Not satisfied | 0<br>1 | Nominal |
| Physical problem | Explanatory variable | Yes<br>No | 0<br>1 | Nominal |
| Afford medicine | Explanatory variable | Yes<br>No | 0<br>1 | Nominal |
| Habit | Explanatory variable | Yes<br>No | 0<br>1 | Nominal |
| Health insurance | Explanatory variable | Yes<br>No | 0<br>1 | Nominal |

## 5. RESULTS AND DISCUSSION

The age at marriage of women in the age group 20–24 was found high 55.20 percent and 42.80 percent for both communities, which is shown in Table 1. Educational level of women graduate and above level is highest 27.60 percent among scheduled tribe women and middle school is found 32.40 among non- scheduled tribe women. Knowledge about Family Planning Programme (FPP) is high among both the communities 85.60 percent and 87.60 percent respectively but use of contraceptives is moderate 52.80 percent and 59.20 percent. Abortion rate, gynecological complications and physical problem is less among both the communities. Most of the women 82.00 percent and 75.60 percent) are satisfied with their reproductive health related treatments since they can afford medicine. A large number of women 52.80 percent scheduled tribe women have habit of drinking alcohol, chewing tobacco but for non- scheduled tribe women it is less 9.60 percent only. Health insurance slightly higher among scheduled tribe 38.80 percent as compared to non- scheduled tribe 23.60 percent.

**Table 1**: The percentage distribution of respondents' reproductive health factors for scheduled tribe and non-scheduled tribe women

| Characteristics | | Scheduled tribe | | Non-scheduled tribe | |
|---|---|---|---|---|---|
| | | Frequency | Percentage | Frequency | Percentage |
| Age at marriage of women (in years) | 15-19 | 36 | 14.40 | 100 | 40.00 |
| | 20-24 | 138 | 55.20 | 107 | 42.80 |
| | 25-29 | 60 | 24.00 | 34 | 13.60 |
| | 30-34 | 16 | 6.40 | 9 | 3.60 |
| Women's Educational level | Illiterate | 13 | 5.20 | 24 | 9.60 |
| | Primary | 24 | 9.60 | 52 | 20.80 |
| | Middle school | 40 | 16.00 | 81 | 32.40 |
| | HSLC | 56 | 22.40 | 56 | 22.40 |
| | HS | 48 | 19.20 | 27 | 10.80 |

| | | | | | |
|---|---|---|---|---|---|
| | Graduate & above | 69 | 27.60 | 10 | 4.00 |
| Knowledge about FPP | Yes | 214 | 85.60 | 219 | 87.60 |
| | No | 36 | 14.40 | 31 | 12.40 |
| Use of contraceptives | Yes | 132 | 52.80 | 148 | 59.20 |
| | No | 118 | 47.20 | 102 | 40.80 |
| Abortion | Yes | 39 | 15.60 | 21 | 8.40 |
| | No | 211 | 84.40 | 229 | 91.60 |
| Gynecological complications | Yes | 42 | 16.80 | 43 | 17.20 |
| | No | 208 | 83.20 | 207 | 82.80 |
| Physical problem | Yes | 68 | 27.20 | 35 | 14.00 |
| | No | 182 | 72.80 | 215 | 86.00 |
| Treatment satisfaction | Satisfied | 205 | 82.00 | 189 | 75.60 |
| | Not satisfied | 45 | 18.00 | 61 | 24.40 |
| Afford medicine | Yes | 193 | 77.20 | 169 | 67.60 |
| | No | 57 | 22.80 | 81 | 32.40 |
| Habit(Drinking alcohol/Tobacco) | Yes | 132 | 52.80 | 24 | 9.60 |
| | No | 118 | 47.20 | 226 | 90.40 |
| Health insurance | Yes | 97 | 38.80 | 59 | 23.60 |
| | No | 153 | 61.20 | 191 | 76.40 |

Source: Primary data

Women's parity determined by women's birth performance. It starts with '0' if no birth is given by a woman. Then it counts by birth order i.e. 1, 2, 3... It is also used as one of the indicators of fertility. From the results shown in the table 2(a) and 2(b), it is observed that Women's educational level, abortion, afford medicine and habit of drinking alcohol, chewing tobacco have a significant association with the number of children of scheduled tribe women. Knowledge about Family Planning Programme (FPP), use of contraceptives, treatment satisfaction and afford medicine have a significant association with the number of children of non-scheduled tribe women. While with the increase of women's and husband's education percentage of higher parity reduces, it is found for both the communities. In the age group 30-34-years, the parity of three or more births is high at 25.00 percent for scheduled tribes and 21.00 percent for non-scheduled tribes in the age group 15-19-years. The percentage distribution of 3 and above parity is lowest among women having Knowledge about Family Planning Programme (FPP), contraceptive users, abortion, gynecological complications, physical problem, treatment satisfaction, afford medicine, habit and Health insurance of both the communities.

**Table 2 (a):** Percentage Distribution of Ever Married Women of reproductive Age (15-49) by Parity and Characteristics of Woman

| **Characteristics** | | **ST Women's Parity** | | | | Chi-square | p-value |
|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 & above | | |
| Age at marriage of women (in years) | 15-19 | 11.11 | 30.56 | 47.22 | 11.11 | 22.617 | 0.308 |
| | 20-24 | 2.17 | 42.03 | 40.58 | 15.22 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 25-29 | 0.00 | 35.00 | 50.00 | 15.00 | | |
| | 30-34 | 0.00 | 31.25 | 43.75 | 25.00 | | |
| Women's Educational level | Illiterate | 0.00 | 15.38 | 46.15 | 38.46 | 88.989 | < 0.000 |
| | Primary | 0.00 | 16.67 | 41.67 | 41.67 | | |
| | Middle school | 10.00 | 27.50 | 52.50 | 10.00 | | |
| | HSLC | 3.57 | 23.21 | 51.79 | 21.43 | | |
| | HS | 2.08 | 43.75 | 47.92 | 6.25 | | |
| | Graduate & above | 0.00 | 63.77 | 30.43 | 5.80 | | |
| Knowledge about FPP | Yes | 3.27 | 37.38 | 44.86 | 14.49 | 3.036 | 0.694 |
| | No | 0.00 | 41.67 | 38.89 | 19.44 | | |
| Use of contraceptives | Yes | 5.30 | 37.12 | 43.94 | 13.64 | 7.305 | 0.199 |
| | No | 0.00 | 38.98 | 44.07 | 16.95 | | |
| Abortion | Yes | 7.69 | 41.03 | 30.77 | 20.51 | 13.521 | 0.019 |
| | No | 1.90 | 37.44 | 46.45 | 14.22 | | |
| Gynecological complications | Yes | 2.38 | 38.10 | 45.24 | 14.29 | 2.016 | 0.847 |
| | No | 2.88 | 37.98 | 43.75 | 15.38 | | |
| Physical problem | Yes | 1.47 | 29.41 | 45.59 | 23.53 | 7.033 | 0.218 |
| | No | 3.30 | 41.21 | 43.41 | 12.08 | | |
| Treatment satisfaction | Satisfied | 2.92 | 39.02 | 42.44 | 15.61 | 1.843 | 0.870 |
| | Not satisfied | 2.22 | 33.33 | 51.11 | 13.33 | | |
| Afford medicine | Yes | 0.52 | 42.49 | 42.49 | 14.51 | 21.362 | 0.001 |
| | No | 10.53 | 22.81 | 49.12 | 17.54 | | |
| Habit | Yes | 0.00 | 36.36 | 45.45 | 18.18 | 11.862 | 0.037 |
| | No | 5.93 | 39.83 | 42.37 | 11.86 | | |
| Health insurance | Yes | 1.08 | 35.48 | 43.01 | 20.43 | 4.893 | 0.429 |
| | No | 3.82 | 39.49 | 42.04 | 12.10 | | |

Source: Primary data

**Table 2 (b):** Percentage Distribution of Ever Married Women of reproductive Age (15-49) by Parity and Characteristics of Woman

| **Characteristics** | | **Non-ST Women's Parity** | | | | Chi-square | p-value |
|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 & above | | |
| Age at marriage of women (in years) | 15-19 | 4.00 | 22.00 | 53.00 | 21.00 | 16.111 | 0.375 |
| | 20-24 | 0.94 | 36.79 | 47.17 | 15.09 | | |
| | 25-29 | 0.00 | 44.44 | 41.67 | 13.89 | | |
| | 30-34 | 0.00 | 62.50 | 25.00 | 12.50 | | |
| Women's Educational level | Illiterate | 12.00 | 28.00 | 36.00 | 24.00 | 32.679 | 0.139 |
| | Primary | 3.85 | 25.00 | 48.08 | 23.08 | | |
| | Middle school | 0.00 | 30.86 | 49.38 | 19.75 | | |
| | HSLC | 0.00 | 33.93 | 53.57 | 12.50 | | |
| | HS | 0.00 | 44.44 | 51.05 | 3.70 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Graduate & above | 0.00 | 66.67 | 22.22 | 11.11 | | |
| Knowledge about FPP | Yes | 2.29 | 34.86 | 48.17 | 14.68 | 11.816 | 0.037 |
| | No | 0.00 | 18.75 | 46.88 | 34.37 | | |
| Use of contraceptives | Yes | 2.05 | 29.45 | 55.47 | 13.01 | 11.333 | 0.045 |
| | No | 1.92 | 37.50 | 37.50 | 23.08 | | |
| Abortion | Yes | 0.00 | 34.78 | 43.48 | 21.74 | 4.870 | 0.432 |
| | No | 2.20 | 32.60 | 48.46 | 16.74 | | |
| Gynecological complications | Yes | 2.22 | 40.00 | 33.33 | 24.44 | 4.903 | 0.428 |
| | No | 1.95 | 31.22 | 51.22 | 15.61 | | |
| Physical problem | Yes | 0.00 | 37.84 | 45.95 | 16.22 | 2.516 | 0.774 |
| | No | 2.35 | 31.92 | 48.36 | 17.37 | | |
| Treatment satisfaction | Satisfied | 0.53 | 38.50 | 48.66 | 12.30 | 21.314 | 0.001 |
| | Not satisfied | 6.35 | 19.05 | 46.03 | 28.57 | | |
| Afford medicine | Yes | 1.78 | 39.05 | 47.34 | 11.83 | 15.336 | 0.009 |
| | No | 2.47 | 22.22 | 49.38 | 25.93 | | |
| Habit | Yes | 0.00 | 28.00 | 36.00 | 36.00 | 7.570 | 0.182 |
| | No | 4.00 | 60.00 | 88.80 | 27.20 | | |
| Health insurance | Yes | 0.00 | 32.79 | 54.10 | 13.11 | 6.120 | 0.295 |
| | No | 2.65 | 32.80 | 46.03 | 18.52 | | |

Source: Primary data

To measure the net effect of independent variables on Child Ever Born (CEB) (dependent variable) multiple regression technique has been performed. Table 3 showed that the intercept values for scheduled and non-scheduled tribes were 2.175 and 1.392 respectively. It shows that live birth will only be 2.175 and 1.392 if the values of all eleven independent variables are set to zero. The regression analysis's findings support the notion that factor educational level of women is highly significant. Abortion, afford medicine has significantly influenced fertility of scheduled tribe women. The factors age at marriage of women, educational level of women, treatment satisfaction and habit has significantly influenced fertility of non-scheduled tribe women. Gynaecological problems are very close to the significant level of non-scheduled tribe women and contraceptive use is very close to the significant level of scheduled tribe women. Additionally, it has been shown that although they are statistically negligible, age at marriage of women, gynecological complications, afford medicine and habit have a beneficial impact on live births of scheduled tribe women and knowledge about FPP, use of contraceptives, gynecological complications, physical problem and treatment satisfaction have a beneficial impact on children ever born(CEB) of non-scheduled tribe women. The Analysis of Variance (ANOVA) table 4 indicates that both the fitted regressions are highly significant (Table 4).

**Table 3**: Regression analysis of reproductive health factors of scheduled tribe and non- scheduled tribe women

| | **Scheduled tribe** | | | **Non-Scheduled tribe** | | |
|---|---|---|---|---|---|---|
| **Characteristics** | Coefficients | t-value | p-value | Coefficients | t-value | p-value |
| Constant | 2.175 | 6.235 | 0.000 | 1.392 | 3.281 | 0.001 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Age at marriage of women | 0.006 | 0.070 | 0.944 | -0.189 | -2.311 | 0.022 |
| Educational level of women | -0.227 | -5.101 | < 0.000 | -0.168 | -3.110 | 0.002 |
| Knowledge about FPP | -0.192 | -1.054 | 0.293 | 0.281 | 1.469 | 0.143 |
| Use of contraceptives | -0.246 | -1.725 | 0.086 | 0.020 | 0.156 | 0.876 |
| Abortion | -0.442 | -2.477 | 0.014 | -0.029 | -0.128 | 0.899 |
| Gynecological complications | 0.087 | 0.450 | 0.653 | 0.295 | 1.676 | 0.095 |
| Physical problem | -0.093 | -0.632 | 0.528 | 0.235 | 1.313 | 0.191 |
| Treatment satisfaction | -0.033 | -0.168 | 0.867 | 0.580 | 3.109 | 0.002 |
| Afford medicine | 0.502 | 3.211 | 0.002 | -0.046 | -0.278 | 0.782 |
| Habit | 0.039 | 0.297 | 0.767 | -0.426 | -2.025 | 0.044 |
| Health insurance | -0.212 | -1.561 | 0.120 | -0.128 | -0.819 | 0.414 |

Source: Primary data

**Table 4**: The Analysis of Variance (ANOVA) table

| | **Scheduled tribe** | | | | | **Non- scheduled tribe** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Sums of squares | d.f. | Mean square | F | Sig. | Sums of squares | d.f. | Mean square | F | Sig. |
| Regression | 56.299 | 11 | 5.118 | 5.307 | < 0.000 | 46.699 | 11 | 4.245 | 4.568 | <0.000 |
| Residual | 229.545 | 238 | 0.964 | | | 220.265 | 237 | 0.929 | | |
| Total | 285.844 | 249 | | | | 266.964 | 248 | | | |

The computed Deviance Value/d.f. of scheduled tribe is 0.985 and non- scheduled tribe is 0.973. This is an indication of under-dispersion in the data. An ideal value would be close to one and fall in the range of 0.9 –1.1. Both scheduled and non-scheduled tribes with the same log likelihood were compared using generalised linear Poisson regression goodness of fit. The Poisson regression model has the least AIC, indicating that it fits the data the best. So, the Poisson regression is the best-fitting model as indicated by the lowest AIC values (Table 5).

**Table 5:** Comparing models based on their goodness of fit characteristics

| Test statistics | Poisson (ST) | Poisson (Non-ST) |
|---|---|---|
| Deviance | 0.985 | 0.973 |
| Log Likelihood | -286.979 | -298.889 |
| AIC | 611.959 | 633.778 |
| BIC | 678.867 | 697.092 |

The scheduled and non-scheduled tribes' Likelihood ratio chi square of Poisson regression is 62.447 ($p<0.05$) and 46.961 ($p<0.05$), respectively, indicating that the combined predictors have a significant impact on the outcome variable of children ever born (Table 6).

**Table 6:** Omnibus test of model coefficients

| Test statistics | Poisson (ST) | Poisson (Non-ST) |
|---|---|---|
| Likelihood Ratio Chi-Square | 62.447 | 46.961 |
| d.f. | 18 | 17 |
| Sig. | < 0.000 | < 0.000 |

**5.1 Interpretation of Poisson regression coefficients**

The results of Table 7(a) and 7(b) shows that the modeling of the number of children ever born with various cofactors of Poisson regression. The estimated Poisson regression coefficients for the dependent variables as well as their contribution in terms of the exponentiated data are interpreted to identify which individual predictor variables are uniquely accountable for the variation in the dependent variable. The categorical predictors are treated as factors and the dummy variables were ordered in a descending manner with the lowest coded category being treated as the reference group.

The dummy variable was coded into six levels representing age groups 15-19, 20-24, 25-29. The age group 30-34 was treated as the reference variable. The analysis reveals that the average decrease of --0.491 and average increase of 0.637 in the log counts of the number of births of scheduled tribe and non-scheduled tribe women are caused by the predicted unit change in the present age of women in the age group 15-19. In terms of the exponentiated parameters, the IRR decreases by 37.80% ((IRR = 0.622, 95% CI: 0.077- 5.031), for scheduled tribe and the IRR increases by 89.10% ((IRR = 1.891, 95% CI: 0.686- 5.212) for non-scheduled tribe, lower risk of scheduled tribe women than the non-scheduled tribe women in this age group and CEB.

The log counts of the number of births of scheduled tribe and non-scheduled tribe women show an average drop of -0.563 and an average increase of 0.356 due to the expected unit change in the present age of women in the 20–24 age groups. In terms of the exponentiated parameters, the IRR decreases by 43.10% ((IRR = 0.569, 95% CI: 0.073- 4.446) for scheduled tribe and the IRR increases by 42.80% ((IRR = 1.428, 95% CI: 0.518- 3.939) for non-scheduled tribe, higher risk of non-scheduled tribe women than the scheduled tribe women in this age group and CEB.

The log counts of the number of births of scheduled tribe and non-scheduled tribe women show an average decrease of -0.462 and an average increase of 0.208 due to the expected unit change in the present age of women in the age group 25-29. In terms of the exponentiated parameters, the IRR decreases by 37.00% ((IRR = 0.630, 95% CI: 0.078- 5.067) for scheduled tribe and the IRR increases by 23.10% ((IRR = 1.231, 95% CI: 0.419- 3.620) for non-scheduled tribe, higher risk of scheduled tribe women than the non-scheduled tribe women in this age group and CEB.

The dummy variable was coded into five levels representing illiterate, primary, middle school, HSLC and HS. Graduate & above was treated as the reference variable. According to the study, an average increase of 1.042 and 0.987 in the log counts of the number of births of scheduled tribe and non-scheduled tribe husbands is attributed to the expected unit change in illiteracy. In terms of the exponentiated parameters, the IRR increases by 183.40% ((IRR = 2.834, 95% CI: 1.509 – 5.323) for scheduled tribe and the IRR increases by 168.40% ((IRR = 2.684, 95% CI: 0.932- 7.731) for non-scheduled tribe, high risk of both the communities and CEB. The predictor illiterate of scheduled tribe is found statistically significant. And very closure to the significant level of non-scheduled tribe.

The log counts of the number of births of scheduled tribe and non-scheduled tribe husbands increase by an average of 1.274 and 0.864, respectively, due to the predicted unit change in primary. In terms of the exponentiated parameters, the IRR increases by 257.40% ((IRR = 3.574, 95% CI: 2.172 – 5.880) for scheduled tribe and the IRR increases by 137.20% ((IRR = 2.372, 95% CI: 0.842 – 6.680) for non-scheduled tribe, high risk of both the communities and CEB. The predictor primary of scheduled tribe is found highly statistically significant.

The log counts of the number of births of scheduled tribe and non-scheduled tribe husbands increase by an average of 0.836 and 0.659, respectively, as a result of the expected unit shift in middle school. In terms of the exponentiated parameters, the IRR decreases by 130.80% ((IRR = 2.308, 95% CI: 1.399– 3.807) for scheduled tribe and the IRR decreases by 93.40% ((IRR = 1.934, 95% CI: 0.698– 5.359) for non-scheduled tribe, high risk of both the communities and CEB. The predictor middle school of scheduled tribe is found statistically significant effect on CEB.

The log counts of the number of births of scheduled tribe and non-scheduled tribe husbands increase by an average of 0.911 and 0.525, respectively, due to the anticipated unit change in HSLC. In terms of the exponentiated parameters, the IRR increases by 148.60% ((IRR = 2.486, 95% CI: 1.567– 3.943) for scheduled tribe and the IRR increases by 69.10% ((IRR = 1.691, 95% CI: 0.600- 4.766) for non-scheduled tribe, high risk of both the communities and CEB. The predictor HSLC of scheduled tribe is found highly statistically significant effect on CEB.

The log counts of the number of births of scheduled tribe and non-scheduled tribe husbands increase by an average of 0.496 and 0.232, respectively, as a result of the expected unit change in HS. In terms of the exponentiated parameters, the IRR increases by 64.20 % ((IRR = 1.642, 95% CI: 0.992- 2.721) for scheduled tribe and the IRR increases by 26.10% ((IRR = 1.261, 95% CI: 0.417- 3.812) for non-scheduled tribe, high risk of both the communities in this age group and CEB. The predictor HS of scheduled tribe is found statistically significant effect on CEB.

The log counts of the number of births of scheduled tribe and non-scheduled tribe women show an average increase of 0.193 and an average drop of -0.238 due to the expected unit change in knowledge about FPP. In terms of the exponentiated parameters, the IRR increases by 21.30% ((IRR = 1.213, 95% CI: 0.805 - 1.829) for scheduled tribe and the IRR decreases by 21.10% ((IRR = 0.789, 95% CI: 0.560- 1.110) for non-scheduled tribe. The study found higher risk of scheduled tribe and lower risk among non-scheduled tribe and CEB.

The log counts of the number of births of scheduled tribe and non-scheduled tribe women show an average rise of 0.262 and an average decrease of -0.024 due to the expected unit change use of contraceptives.In terms of the exponentiated parameters, the IRR increases by 30.00 % ((IRR = 1.300, 95% CI: 0.955- 1.768) for scheduled tribe and the IRR decreases by 21.10% ((IRR = 0.976, 95% CI: 0.750- 1.271) for non-scheduled tribe. The study found higher risk of scheduled tribe and lower risk among non-scheduled tribe and CEB. The predictor use of contraceptives of scheduled tribe is found closure to the statistically significant effect on CEB.

The log counts of the number of births of scheduled tribe and non-scheduled tribe women increase by an average of 0.2046 and decrease by -0.258 due to the expected unit change in gynaecological problems. In terms of the exponentiated parameters, the IRR decreases by 8.80% ((IRR = 0.912, 95% CI: 0.611- 1.362) for scheduled tribe and the IRR decreases by 22.70% ((IRR = 0.773, 95% CI: 0.536 - 1.116) for non-scheduled tribe, lower risk of both the communities and CEB.

The log counts of the number of births of women from scheduled and non-scheduled tribes show an average increase of 0.150 and decline of -0.233 due to the expected unit change in physical problems. In terms of the exponentiated parameters, the IRR increases by 16.20% ((IRR = 1.162, 95% CI: 0.850- 1.590) for scheduled tribe and the IRR decreases by 20.80% ((IRR = 0.792, 95% CI: 0.519- 1.210) for non-scheduled tribe, higher risk of scheduled tribe and loser risk of non-scheduled tribe and CEB.

The log counts of the number of births of scheduled tribe and non-scheduled tribe women show an average rise of 0.052 and an average drop of -0.483 due to the expected unit change in treatment satisfaction. In terms of the exponentiated parameters, the IRR increases by 5.30% ((IRR = 1.053, 95% CI: 0.703- 1.578) for scheduled tribe and the IRR decreases by 38.30% ((IRR = 0.617, 95% CI: 0.436- 0.873) for non-scheduled tribe, higher risk of scheduled tribe and loser risk of non-scheduled tribe and CEB. The predictor treatment satisfaction is found statistically significant effect of non-scheduled tribe.

The log counts of the number of births of scheduled tribe and non-scheduled tribe women show an average drop of -0.494 and an average gain of 0.028 due to the anticipated unit shift in affordable medicine. In terms of the exponentiated parameters, the IRR decreases by 39.00% ((IRR = 0.610, 95% CI: 0.456 - 0.816) for scheduled tribe and the IRR increases by 2.80% ((IRR = 1.028, 95% CI: 0.741 - 1.426) for non-scheduled tribe, loser risk of scheduled tribe and higher risk of non-scheduled tribe and CEB. The predictor afford medicine is found statistically significant effect of scheduled tribe.

The log counts of scheduled tribe and non-scheduled tribe women's births increase by an average of 0.025 and 0.439, respectively, as a result of the anticipated unit change in habit. In terms of the exponentiated parameters, the IRR decreases by 2.50% ((IRR = 1.025, 95% CI: 0.775 – 1.355) for scheduled tribe and the IRR increases by 55.10% ((IRR = 1.551, 95% CI: 1.043– 2.305) for non-scheduled tribe, higher risk of both the communities and CEB. The predictor habit is found statistically significant effect of non-scheduled tribe.

The log counts of scheduled tribe and non-scheduled tribe women's births increase by an average of 0.274 and 0.133, respectively, due to the anticipated unit change in health insurance. In terms of the exponentiated parameters, the IRR increases by 31.50% ((IRR = 1.315, 95% CI: 0.993– 1.742) for scheduled tribe and the IRR decreases by 14.30% ((IRR = 1.143, 95% CI: 0.810– 1.612) for non-scheduled tribe, higher risk of both the communities and CEB. The predictor health insurance is found statistically significant effect of scheduled tribe.

**Table 7(a):** Estimates of Poisson regression coefficients for children ever born of scheduled tribe women

| Variables | Category | B | Std. Error | 95% Wald Confidence Interval | | Hypothesis Test | | Exp(B) | 95% Wald Confidence Interval for Exp(B) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lower | Upper | Wald Chi-Square | Sig. | | Lower | Upper |
| Intercept | | -0.491 | 1.1176 | -2.681 | 1.700 | 0.193 | 0.661 | 0.612 | 0.068 | 5.473 |
| Age at marriage of women Ref: 30-34 | 15-19 | -0.475 | 1.0665 | -2.565 | 1.616 | 0.198 | 0.656 | 0.622 | 0.077 | 5.031 |
| | 20-24 | -0.563 | 1.0486 | -2.618 | 1.492 | 0.289 | 0.591 | 0.569 | 0.073 | 4.446 |
| | 25-29 | -0.462 | 1.0635 | -2.546 | 1.623 | 0.188 | 0.664 | 0.630 | 0.078 | 5.067 |
| Women's Educational level Ref: Graduate & above | Illiterate | 1.042 | 0.3216 | 0.412 | 1.672 | 10.496 | 0.001 | 2.834 | 1.509 | 5.323 |
| | Primary | 1.274 | 0.2541 | 0.776 | 1.772 | 25.132 | 0.000 | 3.574 | 2.172 | 5.880 |
| | Middle school | 0.836 | 0.2554 | 0.336 | 1.337 | 10.721 | 0.001 | 2.308 | 1.399 | 3.807 |
| | HSLC | 0.911 | 0.2354 | 0.449 | 1.372 | 14.971 | 0.000 | 2.486 | 1.567 | 3.943 |
| | HS | 0.496 | 0.2575 | -0.009 | 1.001 | 3.713 | 0.054 | 1.642 | 0.992 | 2.721 |
| Knowledge about FPP Ref: No | Yes | 0.193 | 0.2094 | -0.217 | 0.604 | 0.851 | 0.356 | 1.213 | 0.805 | 1.829 |
| Use of contraceptives Ref: No | Yes | 0.262 | 0.1572 | -0.046 | 0.570 | 2.778 | 0.096 | 1.300 | 0.955 | 1.768 |
| Abortion Ref: No | Yes | 0.345 | 0.1775 | -0.003 | 0.693 | 3.770 | 0.052 | 1.412 | 0.997 | 1.999 |
| Gynecological complications Ref: No | Yes | 0.2046 | -0.493 | 0.309 | 0.204 | .2046 | 0.652 | 0.912 | 0.611 | 1.362 |
| Physical problem Ref: No | Yes | 0.150 | .1598 | -0.163 | 0.464 | 0.885 | 0.347 | 1.162 | 0.850 | 1.590 |
| Treatment satisfaction Ref: Not Satisfied | Satisfied | 0.052 | 0.2064 | -0.353 | 0.456 | 0.062 | 0.803 | 1.053 | 0.703 | 1.578 |
| Afford | Yes | -0.494 | 0.1485 | -0.785 | -0.203 | 11.067 | 0.001 | 0.610 | 0.456 | 0.816 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| medicine Ref: No | | | | | | | | | | |
| Habit Ref: No | Yes | 0.025 | 0.1423 | -0.254 | 0.304 | 0.030 | 0.862 | 1.025 | 0.775 | 1.355 |
| Health insurance Ref: No | Yes | 0.274 | 0.1433 | -0.007 | 0.555 | 3.651 | 0.056 | 1.315 | 0.993 | 1.742 |

Source: Primary data

**Table 7(b):** Estimates of Poisson regression coefficients for children ever born of non-scheduled tribe women

| Variables | Category | B | Std. Error | 95% Wald Confidence Interval | | Hypothesis Test | | Exp(B) | 95% Wald Confidence Interval for Exp(B) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lower | Upper | Wald Chi-Square | Sig. | | Lower | Upper |
| Intercept | | -0.612 | 0.7573 | -2.096 | 0.872 | 0.653 | 0.419 | 0.542 | 0.123 | 2.392 |
| Age at marriage of women Ref: 30-34 | 15-19 | 0.637 | 0.5172 | -0.376 | 1.651 | 1.518 | 0.218 | 1.891 | 0.686 | 5.212 |
| | 20-24 | 0.356 | 0.5176 | -0.658 | 1.371 | 0.474 | 0.491 | 1.428 | 0.518 | 3.939 |
| | 25-29 | 0.208 | 0.5503 | -0.871 | 1.287 | 0.143 | 0.706 | 1.231 | 0.419 | 3.620 |
| Women's Educational level Ref: Graduate & above | Illiterate | 0.987 | 0.5398 | -0.071 | 2.045 | 3.345 | 0.067 | 2.684 | 0.932 | 7.731 |
| | Primary | 0.864 | 0.5282 | -0.171 | 1.899 | 2.674 | 0.102 | 2.372 | 0.842 | 6.680 |
| | Middle school | 0.659 | 0.5201 | -0.360 | 1.679 | 1.607 | 0.205 | 1.934 | 0.698 | 5.359 |
| | HSLC | 0.525 | 0.5288 | -0.511 | 1.561 | 0.986 | 0.321 | 1.691 | 0.600 | 4.766 |
| | HS | 0.232 | 0.5643 | -0.874 | 1.338 | 0.169 | 0.681 | 1.261 | 0.417 | 3.812 |
| Knowledge about FPP Ref: No | Yes | -0.238 | 0.1746 | -0.580 | 0.105 | 1.851 | 0.174 | 0.789 | 0.560 | 1.110 |
| Use of contraceptives Ref: No | Yes | -0.024 | 0.1346 | -0.288 | 0.240 | 0.032 | 0.858 | 0.976 | 0.750 | 1.271 |
| Abortion Ref: No | Yes | 0.051 | 0.2557 | -0.450 | 0.553 | 0.040 | 0.841 | 1.053 | 0.638 | 1.738 |
| Gynecological complications Ref: No | Yes | -0.258 | 0.1872 | -0.625 | 0.109 | 1.893 | 0.169 | 0.773 | 0.536 | 1.116 |
| Physical problem | Yes | -0.233 | 0.2160 | -0.656 | 0.191 | 1.162 | 0.281 | 0.792 | 0.519 | 1.210 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Ref: No | | | | | | | | | | |
| Treatment satisfaction<br>Ref: Not Satisfied | Satisfied | -0.483 | 0.1775 | -0.831 | -0.135 | 7.412 | 0.006 | 0.617 | 0.436 | 0.873 |
| Afford medicine<br>Ref: No | Yes | 0.028 | 0.1668 | -0.299 | 0.355 | 0.028 | 0.868 | 1.028 | 0.741 | 1.426 |
| Habit<br>Ref: No | Yes | 0.439 | 0.2024 | 0.042 | 0.835 | 4.696 | 0.030 | 1.551 | 1.043 | 2.305 |
| Health insurance<br>Ref: No | Yes | 0.133 | 0.1756 | -0.211 | 0.478 | 0.577 | 0.447 | 1.143 | 0.810 | 1.612 |

Source: Primary data

## 6. DISCUSSION

Although both groups' high rates of institutional deliveries are encouraging, Scheduled Tribe women's infant mortality rate was 58.14 per 1,000 live births. Institutional delivery alone therefore cannot be treated as sufficient evidence of effective maternal and newborn care. Continuity across antenatal care, delivery, referral, postnatal follow-up, newborn care and household living conditions may be more informative than the place of delivery considered alone. This view is in line with national data showing that social, quality, and access barriers interact to cause tribal health disparities (Ministry of Health and Family Welfare and Ministry of Tribal Affairs, 2018).

Financial protection also remained weak. Only one-third of Scheduled Tribe respondents and one-quarter of Non Scheduled Tribe respondents reported health-insurance coverage. Among Non Scheduled Tribe women, both medicine affordability and insurance were associated with lower expected fertility after adjustment. These cross-sectional associations cannot establish causality, but they identify financial access as a plausible part of reproductive decision-making and service use.

Treatment satisfaction was the only measured factor associated with lower fertility in both group-specific models. Satisfaction may reflect service availability, respectful care, continuity, information received or successful treatment. Because the survey measured satisfaction broadly, the mechanism cannot be isolated. Future research should differentiate between these factors and investigate if satisfaction influences the contraceptive practices, the spacing of births, or the ongoing use of maternal health services. The association between alcohol or tobacco use and higher fertility among Non Scheduled Tribe women warrants cautious interpretation. The combined variable does not distinguish substance, intensity, duration or household context. The much higher prevalence among Scheduled Tribe women did not translate into a significant adjusted association in that model, illustrating why prevalence differences and regression associations answer different questions.

## 7. CONCLUSION

Based on data from a survey conducted in the Kokrajhar district, the present study has attempted to understand the reproductive health issues of scheduled tribe and non-tribal women, their comprehension of reproductive health, and the effects of various factors on reproductive health. The present analysis shows that low level of health awareness is the major problem in Kokrajhar district. Many indigenous women are unable to make independent decisions on their reproductive health due to a variety of obstacles. To guarantee that all indigenous women may exercise their equal rights to reproductive health, these obstacles must also be identified. Effective implementation of the tribal health programs is necessary to provide tribal women with adequate reproductive health. Financial protection also remained weak. Only one-third of Scheduled Tribe respondents and one-quarter of Non Scheduled Tribe respondents reported health-insurance coverage. Among Non Scheduled Tribe women, both medicine affordability and insurance were associated with lower expected fertility after

adjustment. These cross-sectional associations cannot establish causality, but they identify financial access as a plausible part of reproductive decision-making and service use. One of the main goals of tribal women's reproductive health programs is to increase access to high-quality reproductive health services. The situation of tribal healthcare can be improved via local involvement, human resources, health education, and research that takes tribal health requirements into account. District reproductive health planning should supplement composite indicators with component-level monitoring and community-specific interventions. The study's many implications for improving indigenous women's reproductive health are explained.

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**AUTHOR CONTRIBUTIONS**

Dimacha Dwibrang Mwchahary conceptualized the overall research direction and provided academic supervision.

Ashok Kumar Saha conceptualized the review, developed the multidimensional reproductive health model, led the literature search and synthesis, and prepared the original manuscript draft.

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