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Original Article

The Pattern of Healthcare Provider Choice and The Determinants of Healthcare Utilization: A Household Level Study on The Sonowal Kachari Tribe, Dibrugarh District, Assam

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Abstract: *This study analyses healthcare use patterns and determinants among the Sonowal Kachari tribe using primary data from Dibrugarh, Assam, home to the largest Sonowal Kachari population. The study supports Sustainable Development Goal 3, 'Good health and well-being.' It evaluates the alignment between households' preferences and their actual provider use, analysing the main factors in provider choice. Findings show preferences align with behavior. Private providers have a slight edge over the public. Education, income, insurance, morbidity, and accessibility are major factors in the decision to prefer private providers, while basic demographics matter less.*

Keywords: *Sonowal Kachari Tribe, Healthcare Utilization, Assam, Choice Of Healthcare Providers.*

I. INTRODUCTION

As Amartya Sen notes, health is fundamental to development. Achieving good health requires both preventive and curative care, and healthcare use is vital in this process. Equitable access to providers improves population health and enables progress toward universal coverage. Yet, in many low- and middle-income countries with improved public health infrastructure and financial support, access disparities persist across socio-economic groups. Marginalized ethnic communities, such as some tribes, face disadvantages from geographic isolation, lower education, limited income, and weak links to formal health systems (Andersen, 1995; World Health Organization [WHO], 2014). As a result, these groups use formal healthcare less, leading to delayed care and continued reliance on traditional healing (Gracey & King, 2009).

India is one of the largest low- and middle-income countries. Its tribal population makes up 8.6% (Ministry of Health and Family Welfare, 2019). Despite over seven decades of independence, India still struggles to close the gap between tribal and non-tribal groups. Tribal communities are spread across the country. In particular, the North Eastern States are highly diverse and home to about 12% of India's tribal population, including nearly 133 scheduled tribe groups (Census Report, India 2011). Assam's various ethnic groups, tribes, and castes have distinct socio-economic and cultural traditions. Tribal communities comprise 12.45% of Assam's population (Census of India, 2011). Assam has 9 scheduled tribes in the plain districts and 14 in the hill districts, namely Karbi Anglong and North Cachar Hills (Sengupta, 2002). The major tribes in Assam are Bodo (35.1%), Mishing (17.52%), Karbi (11.1%), Rabha (7.6%), Sonowal Kachari (6.5%), Lalung (5.2%), Garo (4.2%), and Dimasa (3.2%) (Government of India, Ministry of Tribal Affairs, 2016).

India is the world's fifth-largest economy. However, as established above, major health disparities persist among tribal populations. The National Health Policy (2017) aims for Universal Health Assurance in tribal areas and seeks to expand financial protection through government insurance schemes for secondary and tertiary care (Government of India, Ministry of Health and Family Welfare, and Ministry of Tribal Affairs, 2018). Existing research shows that out-of-pocket expenditures remain the main way people cover healthcare costs in India. High out-of-pocket costs restrict access to healthcare and strain households. Therefore, analysis of healthcare utilization patterns and their determinants among tribal groups is essential.

The literature shows that Assam's tribal people face many barriers to formal healthcare. Building on the context of ongoing disparities, the government has tried to reduce these barriers, but structural and behavioural challenges still limit formal healthcare use among tribal groups (Boro & Saikia, 2020; Chutia, 2025).

With these challenges in mind, this study presents a detailed analysis of how specific factors influence provider choice among the Sonowal people in Dibrugarh, Assam. The study is important for three reasons. First, most existing research on

tribal healthcare access in Assam uses descriptive and qualitative methods. There is little micro-level study of what drives provider choice. Moreover, by using odds ratios and marginal effects, this study provides estimates useful for policy that show how different factors affect the likelihood of using healthcare services.

II. REVIEW OF LITERATURE

Research demonstrates that a mix of socio-economic, cultural, and geographic variables influences healthcare service use among tribal and indigenous populations. Studies show that tribal peoples usually underutilize formal healthcare services compared to the general population. This underuse worsens health disparities (Sharma et al., 2025; Mozumdar et al., 2024).

A study conducted in Kerala demonstrates minimal reliance on traditional healthcare among tribal populations. In contrast, public healthcare providers are preferred for both inpatient and outpatient care. Households with a literate head, however, are more likely to choose private healthcare providers. Geographic proximity to formal healthcare remains low among communities such as the Muthuvan and Adiyan (Shabeer & Rejuna, 2025).

Boro & Saikia (2020) analysed the factors constraining the effective utilization of healthcare services among the Bodo people of Assam. They found that demand-side factors such as financial condition, distance to health facilities, poor public transportation, poor behavior of hospital staff, and infrastructure shortages were the main barriers on the demand side. On the supply side, a lack of human resources was the main obstacle to using health facilities.

A further study indicates that formal healthcare service utilization is low among tribal households in Palghar district, Maharashtra, and the severity of illness strongly influences their healthcare-seeking behavior. Additionally, the practice of spiritual healing methods remains common, highlighting persistent cultural barriers (Asokan et al., 2025).

Likewise, a study by Taraphdar et al. (2022) in Midnapur, West Bengal, found that illiterate tribal people preferred public healthcare more than literate people. Lower per capita income increases the use of government providers. The study notes that traditional healing practices persist not out of preference but to save time. Poverty, illiteracy, and geographical isolation remain major barriers to better tribal health.

Adding to this evidence, a study on healthcare-seeking among tribes shows that tribal people go to private clinics only if not cured elsewhere. Many still prefer home remedies and visit traditional medicine healers. The study lists several barriers to seeking healthcare, including poor accessibility, inadequate infrastructure, inability to miss work, inconvenient visiting hours, and disease condition. Personal factors also play a role. Fear of losing earnings, cultural beliefs, affordability, illiteracy, and unacceptability all affect healthcare-seeking (Venkatramana & Latheef, 2019).

Moreover, the use of medicinal plants and home remedies based on traditional, popular, or religious beliefs is common among them for treating some diseases (Hazarika & Borah, 2020).

Similarly, women in the Tangsa community generally resort to traditional healing practices to treat many common diseases. Apart from this, very few of them avail of benefits from various government health schemes in the Margherita subdivision of Tinsukia district, Assam (Sarma & Dutta, 2019).

It has also been reported that the Sonowal Kachari tribe attributes diseases to supernatural forces and seeks cures through traditional rituals rather than visiting nearby health facilities (Das et al., 2008). Thus, traditional beliefs have been reported to act as obstacles to the use of modern healthcare facilities.

III. OBJECTIVES

- To assess the extent to which households' stated preferences correspond with their actual utilisation of health-care providers among the Sonowal Kachari tribe.
- To identify the key factors that influence provider choice.
- To examine whether the presence of morbidity shapes the provider choice.

IV. CONCEPTUAL AND THEORETICAL FRAMEWORK

Healthcare utilization theories provide a framework for analysing access patterns, barriers to care, and the impact of socio-cultural, economic, and structural determinants. There are several theories related to healthcare utilization. These include the Health Belief model (Rosenstock, 1966), Behavioral Model of Health Care Utilization (Andersen, 1968), Access to Care Framework (Penchansky & Thomas, 1981), Socio-Ecological model (Bronfenbrenner, 1979), and Theory of Planned Behavior (Ajzen, 1991). Among these, Andersen's Behavioral model of health care utilization is the most commonly used theoretical framework to study healthcare utilization. According to this theory, healthcare utilization depends on three basic factors. These are enabling, predisposing, and need factors. This framework provides a benevolent lens for assessing provider choice in tribal settings. The following diagram gives an overview of Andersen’s model.

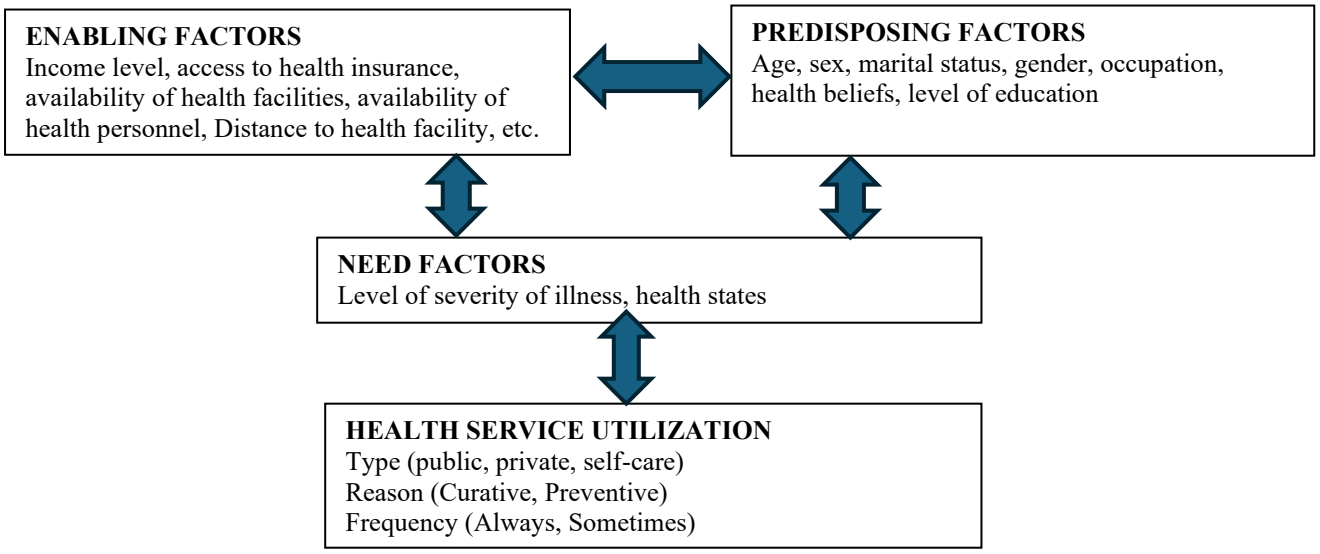

Figure 1. Andersen's Behavioral Model of Health Care Utilization

Source: *(Adongo & Asaarik, 2019)*

V. METHODOLOGY

A) Data and Sample

This study used primary household data gathered from 384 Sonowal Kachari households of Dibrugarh district. In this analysis, households are divided into two categories, i.e., 1. Households with and without morbidity 2. Households with morbidity. The questionnaire used in this survey is designed in such a way as to collect information on socio-economic characteristics as well as access to health care facilities, insurance coverage, and health care service utilisation behaviour of the respondents.

Following the existing health economics literature review, health care utilisation is conceptualised as a two-stage decision-making process. At first, households form preferences regarding health care-seeking and access, while actual provider choice is realised at the level of individual illness episodes, conditional on medical need and severity (Andersen, 1995; Mwabu et al., 1993; Pohlmeier & Ulrich, 1995)**.** In the present study, we incorporate both stated preferences (SP) and revealed preferences (RP) with Anderson's Healthcare Utilization model to examine whether households' intended provider choices converge into actual utilisation behaviour. To fulfil the two-stage decision-making process, separate logit regression models are employed for both Stated and revealed preferences.

B) Analytical Model

A binary logistic regression is estimated with robust standard error. We estimated separate models for stated and revealed preferences, accounting for two household categories. This helps us to make a comparison between:

- Stated preference for healthcare provider and actual realisation behaviour of the households
- Choice of providers in the presence and absence of morbidity.

C) Econometric Model

$$\text{L: Pr}\,(D_i = 1) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \varepsilon_i$$

$$\text{Where, L: Pr}\,(D_i = 1) = \ln\left(\frac{D_i}{1-D_i}\right)$$

$\widehat{D_i}$ produced by an estimated logit equation is an estimate of the probability that D_i=1. It is the probability that a household primarily uses a private healthcare provider.

D) Dependent Variable

In this study, the dependent variable is selected under two frameworks to assess the robustness of our analytical model. In the first framework, the most commonly chosen healthcare facility among household members is treated as the dependent variable. At the same time, the dependent variable is selected based on the total number of visits to the healthcare service provider by household members during the ailment. In both frameworks, we modelled a dichotomous dependent variable, which is the choice of healthcare provider for both Revealed Preference (RP) and Stated Preference (SP). Choice of healthcare provider is coded as below.

0 = Public Healthcare Provider
1 = Private Healthcare Provider

E) Explanatory Variables

In this study, explanatory variables are selected on the basis of Anderson's Behavioural Model of Healthcare Utilization.

Table 1: Classification of Determinants Influencing Household Health Outcomes

Types	Variables
Predisposing Factor	Adult Education Index, Age of Household Head, Sex of the Household Head
Enabling Factor	Family Income, Family Size, Government Health Insurance
Need Factors	Household Severity Index, Morbidity Incidence in HH, Households having any morbidity

Adult Education Index:

Let the highest level of education of the household members of each family be H. The average education of all household members is given by e. The Adult Education Index is given as follows:

When $H \geq 1$ & $e \geq 1$(Das & Mishra, 2020)

Age of the Household head:

It is the age of the household head during the reference period.

Sex of the Household head:

The gender of the household head refers to the sex of the household head. It is defined as follows,

- 1 = Male
- 2 = Female

Family Income:

The household's monthly income during the reference period is considered the family income.

Family size:

It is the total number of family members in a household during the reference period.

Government Health Insurance:

It refers to the enrolment of households in the government health insurance program. If the household is enrolled, we assign 1; if not, we use 0 to indicate that household.

Household's Self-Reported Morbidity:

Household morbidity indicates the total number of diseases reported in a household during the considered period.

Household with any morbidity:

It refers to the presence of any morbidity in the household during the reference period. If the household reported any morbidity, the value 1 is assigned, and if not, the value 0 is assigned to the household.

Household with multimorbidity:

A household with multimorbidity refers to the number of households wherein there is at least one member who reported more than one illness episode during the reference period.

Household's Self-Reported Severity Index:

The disease severity is measured using an ordinal scale ranging from 0 to 2, with greater severity associated with higher values. To ensure equivalence across households, episode-level severity is normalized by dividing the observed severity score by the maximum possible value (2), yielding a normalized severity index ranging from 0 to 1. The household-level Severity Index is calculated as the illness episode weighted average of normalized severity across all disease episodes observed within a household. Although the metric for severity relies on self- reported data, the majority of household responses were predicted on formal clinical evaluations, thereby aligning subjective perceptions with professional medical expertise. The formula is given below for household *i* with *Ei* disease episodes:

$$HSI_i = \frac{1}{E_i}\sum_{e=1}^{E_i}\frac{S_{ie}}{3} \qquad \text{(UNDP, 2019)}$$

Where, S_{ie} = severity score of episode e in household i. We assigned a missing value to households with no observed illness episodes, while households reporting illness episodes with zero severity assigned a severity index of zero.

VI. RESULTS AND DISCUSSION

A) Socio-economic profile

This section provides a glimpse of demographic and socio-economic characteristics of the surveyed households during the reference period. It comprises the gender composition of household heads and the distribution of households according to the age of the household head. Additionally, the distribution of households by family member size. The following tables 1, 2, and 3 reflect the demographic characteristics accordingly.

Table 2: Distribution of households by the gender of the household head

Sex of the Household Head	Freq.	Percent	Cum.
Male	306	79.69	79.69
Female	78	20.31	100.00
Total	384	100.00	

Note: *Author's Calculation*

Table 1 shows the distribution of households by gender composition among the surveyed households. Out of 384 households, a large majority are headed by males (79.69 per cent), while only 20.31 per cent of households are headed by females. This reflects the prevailing patriarchal household structure in the study area.

Table 3: **Distribution of Households by Age of the Household Head (Exclusive Class Intervals)**

Age of household head (in years)	Frequency	Percent	Cumulative
20 - 30	9	2.34	2.34
30 - 40	48	12.50	14.84
40 - 50	100	26.04	40.89
50 - 60	114	29.69	70.57
60 - 70	84	21.88	92.45
70+	29	7.55	100.00
Total	384	100.00	

Source: *Author's Calculation from surveyed data*

Table 2 reveals that most household heads fall within the economically active age groups. The largest proportion belongs to the 50–60 years age group (29.69 per cent), followed by the 40–50 years (26.04 per cent) and the 60–70 years (21.88 per cent) age groups. Together, these three age groups account for more than three-fourths of the sample households. Households with younger household heads aged 20–30 years constitute only 2.34 per cent of the sample, while households with household heads aged 70 years and above constitute 7.55 per cent.

Table 4: Distribution of Households by Family Size

Size of the family	Frequency	Percent	Cumulative
1	4	1.04	1.04
2	21	5.47	6.51
3	76	19.79	26.30
4	133	34.64	60.94
5	73	19.01	79.95
6	42	10.94	90.89
7	21	5.47	96.35
8	10	2.60	98.96
9	3	0.78	99.74
10	1	0.26	100.00
Total	384	100.00	

Source: *Author's Calculation from surveyed data*

Table 3 shows that medium-sized families are most common in the study area. Households with four family members constitute the largest group, accounting for 34.64 per cent of the total sample, followed by households with three (19.79%) and five (19.01%) members. There are only a few families with one or two members, which constitute a relatively small share, while large families with six or more members account for about 20 per cent of households. This indicates a predominance of nuclear and small joint family structures.

Table 5: Distribution of households by occupation of the household head

Occupation of the household head	Frequency	Percent	Cumulative
Government sector	65	16.93	16.93
Private sector	44	11.46	28.39
Daily wage earner	48	12.50	40.89
Business	62	16.15	57.03
Agriculture/ Allied	93	24.22	81.25
Professional	19	4.95	86.20
Others	53	13.80	100.00
Total	384	100.00	

Source: *Author's Calculation from surveyed data*

Table 4 presents the occupational distribution of household heads across the surveyed households. It shows that agriculture and allied activities are the principal sources of livelihood, accounting for 24.22 per cent of household heads. Employment in the government sector (16.93 per cent) and business activities (16.15 per cent) also account for a substantial share. Additionally, daily wage earners constitute 12.50 per cent of the sample, indicating the presence of informal and vulnerable employment. In contrast, a smaller proportion of household heads are professionals (4.95 per cent), while 13.80 per cent are engaged in other miscellaneous occupations.

Table 6: Distribution of Households by the Education Level of the Household Head

Education level of the household head	Frequency	Percent	Cumulative
Illiterate	39	10.16	10.16
Primary	37	9.64	19.79
High school	190	49.48	69.27
Higher secondary	76	19.79	89.06
Graduate	36	9.38	98.44
Post graduate	3	0.78	99.22
Others	3	0.78	100.00
Total	384	100.00	

Source: *Author's Calculation from surveyed data*

Table 5 reflects the educational profile of household heads. It refers that nearly half of them have attained education up to the high school level (49.48 per cent). Accordingly, higher secondary education is reported by 19.79 per cent of household heads, while graduates and postgraduates together constitute about 10 per cent. Illiteracy remains at 10.16 per cent, indicating that a non-negligible section of household heads lacks formal education. Overall, the table suggests moderate educational attainment with limited higher education among household heads.

Table 7: **Distribution of households by income quantile**

Income quantile	Frequency	Percent	Cumulative
Q1: Income <= 15000	82	21.35	21.35
Q2:15000 < Income <= 21000	72	18.75	40.10
Q3:21000 < Income <= 30000	77	20.05	60.16
Q4:30000 < Income <= 50000	78	20.31	80.47
Q5: Income > 50000	75	19.53	100.00
Total	384	100.00	

Source: *Author's Calculation from surveyed data*

Table 6 shows the income distribution across the households in quantiles that appear relatively even. The lowest income group (Q1: income up to ₹15,000) accounts for 21.35 per cent of households, while the highest income group (Q5: income above ₹50,000) represents 19.53 per cent. The middle-income groups (Q2-Q4) together constitute about 59 per cent of the sample. This relatively balanced distribution indicates the presence of households across different income strata, with a slight concentration in the lower and middle-income categories.

B) Health Status

This part of the study presents the health status of the study area during the reference period. To study the health status of the surveyed households, morbidity is used as a proxy.

Table 8: Household-wise morbidity records

Morbidity Status of Households	No. of disease episodes in the reference period											
	0	1	2	3	4	5	6	7	8	10	15	Total
0	66	0	0	0	0	0	0	0	0	0	0	66
	17.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.19
1	0	89	116	66	27	10	5	2	1	1	1	318
	0.00	23.18	30.21	17.19	7.03	2.60	1.30	0.52	0.26	0.26	0.26	82.81
Total	66	89	116	66	27	10	5	2	1	1	1	384
	17.19	23.18	30.21	17.19	7.03	2.60	1.30	0.52	0.26	0.26	0.26	100.00

Note: *0: Households with no morbidity, 1: Households with morbidity. The first row has frequencies, and the second row has cell percentages.*

Table 7 shows the distribution of households by the number of illness episodes during the reference period. The table shows that 17.2% of households reported no morbidity. Moreover, 30.2% reporting two illness episodes, while 17.2% reporting three episodes. The distribution of different morbidities across households represents the different levels of disease burden. A small subset of households experienced extreme disease burden during the reference period. The uneven distribution of disease burden across households highlights heterogeneity in healthcare needs. This variation gives a key source of identifying information for econometric analysis, as the intensity of morbidity influences both the frequency of health care utilization and the choice of healthcare provider.

Table 9: Distribution of Multimorbidity at the household and member level

Household with any multimorbidity	No. of members with more than one disease					
	0	1	2	3	4	Total
No multimorbidity	279	0	0	0	0	279
	72.66	0.00	0.00	0.00	0.00	72.66
Households with multimorbidity	0	80	21	2	2	105
	0.00	20.83	5.47	0.52	0.52	27.34
Total	279	80	21	2	2	384
	72.66	20.83	5.47	0.52	0.52	100.00

Source: *Author's Calculation from surveyed data*
Note: *The first row has frequency, and the second row has cell percentage*

Table 8 shows the presence of multimorbidity across households. The table shows that 72.7% of households report no multimorbidity, whereas 27.3% experience multimorbidity. Apart from this, 20.8% of households have a member with multiple conditions, while a few households (6.51%) report two or more multimorbid members. Multimorbidity is present in over one-quarter of households, with limited intensity. Furthermore, the clustering of multiple illness episodes within households is relatively rare, indicating that demand for healthcare arising from multimorbidity is disproportionately distributed rather than widespread. From an econometric perspective, this justifies incorporating indicators of multimorbidity or severity into the model to capture heterogeneity in expected utility across public and private healthcare providers.

C) Enrolment of households in the Government Health Insurance Programme and Choice of Healthcare Provider

Table 9 below provides an idea of household registrations in the government health insurance programme in the studied area during the reference period. This indicates that, overall, approximately 64.84% households are enrolled in the government health insurance programme. Consequently, government health insurance coverage is slightly higher among households with morbidity (65.09%) than among households without morbidity (63.64%). This suggests that taking part in government health insurance is non-random. It reflects the possibility of either greater awareness or more effective targeting of vulnerable households, as well as the health risks faced by the enrolled households.

Table 10: Registration in the Government Health Insurance Programme

Whether the household is registered under the government insurance scheme	Morbidity Status of Households		
	Households with no morbidity	Households with morbidity	Total
Yes	42	207	249
	63.64	65.09	64.84
No	24	111	135

	36.36	34.91	35.16
Total	66	318	384
	100.00	100.00	100.00

Source: *Field Survey*

Table 11: Household Preference for Health Care Provider- Revealed vs Stated

Majority Used Health Care Source	Preferred Medical Facility		
	Public	**Private**	**Total**
Public	179	0	179
	46.61	0.00	46.61
Private	0	205	205
	0.00	53.39	53.39
Total	179	205	384
	46.61	53.39	100.00

Note: *The first row has frequencies, and the second row has cell percentages*
Source: *Author's calculation*

Table 7 compares the revealed and stated preferences of households regarding the choice of healthcare providers during the study period. This table shows that 46.6% of households both chose and preferred public healthcare, while 53.4% consistently used and preferred private healthcare. It indicates that the household's stated preferences align perfectly with its actual behavior. This reflects a strong and consistent provider choice, with no evidence of constraint-driven deviation between preference and use. Moreover, private healthcare providers are marginally more preferred and utilized than public facilities.

The complete alignment between households' stated preferences and revealed choices suggests that provider selection reflects deliberate utility-maximizing behavior rather than reporting bias and short-term constraints. It justifies modelling healthcare provider choice as a function of observable household characteristics, without correcting for preference misreporting. Thus, econometric specification can treat observed utilization as a valid proxy for implicit preferences, enabling reliable estimation of the determinants of public versus private provider choice.

Table 12: Household Preference for Health Care Provider (Majority Choice in consultation vs. Most Visited)

Majority Used Health Care Source	Most visited Health Care Source		
	Public	Private	Total
Public	176	3	179
	45.83	0.78	46.61
Private	4	201	205
	1.04	52.34	53.39
Total	180	204	384
	46.88	53.12	100.00

Note*: The first row has frequencies, and the second row has cell percentages*
Source*: Author's calculation*

The table mentioned above examines the consistency in actual utilization behavior across consultations in terms of the major choice vs. the most visited choice by the households during the ailment. Utilization of healthcare providers remains highly stable over time. Once they choose a dominant provider type, they tend to rely on it consistently. The high degree of consistency between the majority source and the most visited provider suggests strong persistence in healthcare utilization behavior. The result shows that the households whose majority source is public (98.3%) also report public as the most visited healthcare provider. Similarly, 98% households that reported private healthcare as their majority choice also reported the same choice as the most visited. Only a few households (1-2%) switch providers across visits.

D) Estimated result of the regression model

Table 12 shows the estimated results of the regression model for the determinants of household utilization of healthcare service providers. The result shows that the likelihood ratio Chi-square statistics are statistically significant across all three models. It indicates that the set of explanatory variables jointly explains the choice of healthcare provider better than a model with only an intercept.

Model 1, which comprises all households irrespective of the presence of morbidity during the reference period, shows that the demographic factors sex and age of the household head are not statistically significant. It may be due to improved access to information, enabled by the higher penetration of information and communication technologies (ICTs), which has reduced the relative importance of the household head's sex and age in health-care decision-making. In such a context, gender and experience of the household head appear to matter less than socio-economic and institutional factors.

This explanation is supported by the fact that adult education is statistically significant and positive. This implies that a one-unit increase in adult education raises the odds of utilising private health-care facilities by approximately 11 percent, which in turn reflects the strong role of education in shaping health-care-seeking behaviour. Moreover, household income is also positive and significant, suggesting that economically better-off households are more likely to opt for private health-care providers. In contrast, distance to the nearest medical facility is significant but negatively associated with the use of private health care, implying that greater distance reduces the likelihood of choosing private facilities.

Models 2 and 3 differ from Model 1 in two important aspects: (i) they include only households that experienced morbidity, and (ii) they incorporate morbidity-specific explanatory variables, which are relevant only for the households with illness and therefore are excluded from Model 1. Despite these differences, the results are largely consistent across all three models with respect to the explanatory variables that are present in all three models, indicating robustness of the findings.

In both Models 2 and 3, the severity index is not statistically significant. In Model 2, the total number of disease episodes per household (hh_morbidity) is also insignificant, indicating that the frequency of illness alone does not significantly influence the choice of private health-care facilities. However, when hh_morbidity is replaced by member hh_any_multi_disease in Model 3, which captures the presence of at least one household member suffering from multiple diseases, the coefficient becomes positive and statistically significant. This shows that households facing more complex health conditions are significantly more likely to seek private health care.

Overall, in accordance with Andersen's Behavioural model, the results demonstrate that the utilisation of private health-care facilities is primarily driven by enabling factors rather than predisposing factors. Education, income, access to health insurance, and proximity to healthcare facilities ultimately determine whether households can translate health needs into sustained utilisation of preferred health-care providers. Moreover, while the mere occurrence or frequency of morbidity does not significantly affect provider choice, the presence of multiple illness episodes within a household substantially increases the likelihood of opting for private care.

Table 13: Determinants of Household Utilization of Health Care Service Providers

	(1)	(2)	(3)
VARIABLES	**Full sample**	**Sample with morbidity incidence**	**Sample with morbidity incidence**
sex_hh	1.430 (0.427)	1.213 (0.385)	1.259 (0.400)
age_hh	0.989 (0.011)	0.980 (0.012)	0.981 (0.012)
adult_edu_index	1.142*** (0.055)	1.173*** (0.063)	1.172*** (0.064)
	1.142*** (0.055)	1.173*** (0.063)	1.172*** (0.064)
fam_income	2.231*** (0.533)	1.916** (0.492)	1.992*** (0.525)
fam_size	1.089 (0.112)	1.131 (0.130)	1.117 (0.127)
gov_hinsurance	2.201*** (0.602)	2.738*** (0.851)	2.735*** (0.842)
DistncNMF	0.938** (0.028)	0.914** (0.034)	0.911** (0.034)
hh_sev_index		1.522 (0.727)	1.713 (0.841)
hh_morbidity		0.987 (0.088)	
hh_any_morbidity	1.927* (0.654)		
hh_any_multi_disease			0.586*

			(0.163)
Constant	0.000*** (0.000)	0.001*** (0.002)	0.001*** (0.001)
Observations	384	318	318
Pseudo R-squared	0.165	0.166	0.175
Chi-sqrd	73.50	62.79	65.18
Log Likelihood	-221.5	-181.2	-179.3
Mean VIF	1.280	1.280	1.280

***Note**: Robust standard error of the odds ratio in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

E) Marginal effects

The marginal effect shows that a one-unit increase in the adult education index increases the probability of choosing a private healthcare provider by 2.6 percentage points in the full sample and by around 3 percentage points in the morbidity subsample, holding other factors constant. It is consistent with the result of earlier logit, which also indicates that education fosters awareness and confidence in accessing private healthcare services.

Similarly, an increase in family income raises the likelihood of choosing private healthcare by 15.8 percentage points in the full sample and around 12–13 percentage points among households with morbidity incidence. This reflects that affordability remains a critical constraint, and economically better-off households more frequently choose private healthcare. Meanwhile, the households enrolled in government health insurance schemes are more likely to use private healthcare facilities by 15-19 percentage points. It suggests that access to government health insurance reduces the financial burden and enables households to utilise private providers rather than substituting for them.

Moreover, Distance to the nearest medical facility negatively affects private healthcare utilisation. One unit increase in distance reduces the probability of choosing a private provider by about 1.3–1.8 percentage points, indicating a physical barrier to healthcare choice.

In contrast to this, the demographic factors family size, sex, and age of the household head do not exhibit statistically significant marginal effects, implying that these demographic factors do not independently influence the probability of private versus public provider choice once the factors remain constant.

Along with this, health status indicators show mixed effects, while any morbidity incidence at the household level significantly increases the probability of opting for private healthcare facilities by 13 percent. In contrast to this, the presence of multiple illness episodes reduces the likelihood of choosing private providers. This suggests that households with more complex or chronic health conditions may rely more on public healthcare facilities, likely due to cost considerations or continuity of care.

In aggregate, the result confirms and strengthens the insights from the logit coefficients: education, income, insurance coverage, morbidity incidence, and accessibility play decisive roles in mapping household preferences toward private healthcare, while the role of basic demographic characteristics is comparatively negligible.

Table14: **Marginal Effects of Determinants of Household Utilization of Health Care Service Providers**

VARIABLES	**(1)**	**(2)**	**(3)**
VARIABLES	**Full sample - Marginal Effects**	**Sample with morbidity incidence - Marginal Effects**	**Sample with morbidity incidence - Marginal Effects**
sex_hh	0.070 (0.059)	0.038 (0.062)	0.044 (0.061)
age_hh	-0.002	-0.004	-0.004
	(0.002)	(0.002)	(0.002)
adult_edu_index	0.026***	0.031***	0.030***
	(0.009)	(0.010)	(0.010)
fam_income	0.158***	0.126***	0.132***
	(0.045)	(0.048)	(0.048)
fam_size	0.017	0.024	0.021
	(0.020)	(0.022)	(0.022)
gov_hinsurance	0.155***	0.195***	0.193***
	(0.052)	(0.058)	(0.057)

DistncNMF	-0.013**	-0.017**	-0.018***
	(0.006)	(0.007)	(0.007)
hh_sev_index		0.082	0.103
		(0.092)	(0.094)
hh_morbidity		-0.002	
		(0.017)	
hh_any_morbidity	0.129**		
	(0.066)		
hh_any_multi_disease			-0.102*
			(0.053)
Observations	384	318	318

Note: *Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1*

F) Robustness check

To check the robustness of the findings, we redefined the dependent variable. Here, the most visited healthcare provider by households is considered the dependent variable. Along with this, we used the geometric education index instead of the adult education index to assess the stability of baseline estimates. The table given below shows the result. As the result is identical to the baseline model, the odds ratio of the marginal effect is skipped.

Table 15: **Determinants of Household Utilization of Health Care Service Providers**

VARIABLES	**(1)**	**(2)**	**(3)**
VARIABLES	**Full sample**	**Sample with morbidity incidence**	**Sample with morbidity incidence**
sex_hh	1.376	1.166	1.197
	(0.405)	(0.366)	(0.375)
age_hh	0.988	0.980	0.980
	(0.011)	(0.012)	(0.012)
geo_edu_index	1.161***	1.183***	1.178***
	(0.066)	(0.074)	(0.074)
fam_income	1.893***	1.640*	1.681**
	(0.457)	(0.423)	(0.443)
fam_size	1.031	1.069	1.045
	(0.100)	(0.113)	(0.110)
gov_hinsurance	2.026***	2.446***	2.472***
	(0.552)	(0.752)	(0.761)
DistncNMF	0.935**	0.904***	0.902***
	(0.027)	(0.033)	(0.033)
hh_sev_index		2.210	2.627
		(1.590)	(1.925)
hh_morbidity		0.945	
		(0.089)	
hh_any_morbidity	1.883*		
	(0.622)		
hh_any_multi_disease			0.623*
			(0.170)
Constant	0.000***	0.003***	0.002***
	(0.001)	(0.006)	(0.005)
Observations	384	318	318
Pseudo R-squared	0.147	0.146	0.152
Chi-sqrd	67.70	57.44	58.80
Log Likelihood	-226.4	-185.8	-184.5
Mean VIF	1.280	1.280	1.280

Note: *Robust standard error of the odds ratio in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

VII. CONCLUSION

This study indicates that households' stated preferences perfectly align with their actual behavior. It reflects a strong and consistent provider choice, with no evidence of constraint-driven deviation between preference and use. Besides, private healthcare providers are marginally more preferred and utilized than public facilities. Education, income, insurance coverage, morbidity incidence, and accessibility play decisive roles in mapping household preferences toward private healthcare, while the role of basic demographic characteristics is comparatively negligible. Along with this, health status indicators show mixed effects, while any morbidity incidence at the household level significantly increases the probability of opting for private healthcare facilities. In contrast to this, the presence of multiple illness episodes reduces the likelihood of choosing private providers. This suggests that households with more complex or chronic health conditions may rely more on public healthcare facilities, likely due to cost considerations or continuity of care. Overall, in accordance with Andersen's Behavioural model, the results demonstrate that the utilisation of private health-care facilities is primarily driven by enabling factors rather than predisposing factors. Education, income, access to health insurance, and proximity to healthcare facilities ultimately determine whether households can translate health needs into sustained utilisation of preferred health-care providers. While the mere occurrence or frequency of morbidity does not significantly affect provider choice, the presence of multiple illness episodes within a household substantially increases the likelihood of opting for private care. This micro-level analysis suggests that the Sonowal people are increasingly using formal healthcare facilities.

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