Chapter 4

HEALTH CARE EXPENDITURE AND THE FINANCING MEASURES

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4.1. Introduction:

This chapter aims to quantify approximately how much a rural household of Assam has to spend in a year for availing different health care treatments/services with respect to the type of provider (i.e., public, private) visited and to discover how each household pay for these expenses. The total household health care expenditure has been divided into two broad categories: direct and indirect costs of healthcare. Both direct and indirect cost components are further segmented into several relevant categories of expenses for different types of treatment (in-patient/out-patient) or treatment outcomes (death/cured/chronic). All possible types of financing measures have been considered to identify the financing pattern adopted by rural households.

Several conclusions have been drawn with the help of the primary data collected through a household survey carried out with the help of a detailed interview schedule from a sample of 1080 households from 108 villages from the three selected districts. The basic demographics of the sample have been tabulated in the following table (Table 13).

Table 13: Sample Demographics

Demographics		Nalbari	Darrang	Morigaon	Total
Religion	Hindu	188 (17.4%)	192 (17.8%)	261 (24.2%)	641 (59.4%)
	Muslim	82 (7.6%)	128 (11.9%)	229 (21.2%)	439 (40.6%)
Social Group[18]	General	193 (17.9%)	286 (26.5%)	167 (15.5%)	646 (59.8%)
	OBC	27 (2.5%)	184 (17.0%)	68 (6.3%)	279 (25.8%)
	SC	50 (4.6%)	1 (0.1%)	0 (0.0%)	51 (4.7%)
	ST	0 (0.0%)	19 (1.9%)	85 (7.9)	104 (9.6)

[18] Indian population is divided into four broad categories in official statistics: Scheduled Caste (SC), scheduled Tribe (ST), Other Backward Class (OBC), and General Category (comprising of the 'upper' castes)

Type of Household[19]	Pucca	73 (6.8%)	159 (14.7%)	83 (7.7%)	315 (29.2%)
	Semi-pucca	60 (5.6%)	86 (8.0%)	52 (4.8%)	198 (18.3%)
	Kucha	137 (12.7%)	245 (22.7%)	185 (17.1%)	567 (52.5%)
Household Ownership	Own	270 (25.0%)	320 (29.6%)	489 (45.3%)	1078 (99.9%)
	Rented	0 (0.0%)	0 (0.0%)	1 (0.1%)	1 (0.1%)
Family Size	Single/ 1 member	2 (0.2%)	10 (0.9%)	2 (0.2%)	14 (1.3%)
	2 members	13 (1.2%)	23 (2.1%)	15 (1.4%)	51 (4.7%)
	3-4 members	130 (12%)	256 (23.7%)	115 (10.6%)	501 (46.4%)
	5-6 members	89 (8.2%)	140 (13%)	113 (10.5%)	342 (31.7%)
	7 or members	36 (3.3%)	61 (5.6%)	75 (6.9%)	172 (15.9%)
Agricultural land possession	Landless	189 (17.5%)	166 (15.4%)	164 (15.2%)	519 (48.1%)
	Marginal (Less than1 hectare)	76 (7.0%)	306 (28.3%)	129 (11.9%)	511 (47.3%)
	Small (1-2 hectare)	5 (0.5%)	11 (1.0%)	17 (1.6%)	33 (3.1%)
	Semi-Medium (2-4 hectare)	0 (0%)	5 (0.5%)	9 (0.8%)	14 (1.3%)
	Medium (4-10 hectare)	0 (0%)	2 (0.2%)	1 (0.1%)	3 (0.3%)
	Large (Above 10 hectare)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Annual Income	Up to Rs. 60000	59 (5.5%)	105 (9.7%)	60 (5.6%)	224 (20.7%)
	Rs. 60001–Rs. 90000	56 (5.2%)	111 (10.3%)	48 (4.4%)	215 (19.9%)
	Rs. 90001-	56	95	58	209

[19] *Pucca* house is one, which has walls and roof made of the following material: Wall material: Burnt bricks, stones (packed with lime or cement), cement concrete, timber, *ekra* etc. A Semi-*Pucca* house is a house that has fixed walls made up of pucca material but roof is made up of the material other than those used for pucca house. When the walls and/or roof of the houses are made of material other than those mentioned above, such as unburnt bricks, bamboos, mud, grass, reeds, thatch, loosely packed stones, etc. then they are treated as *Kucha* house

	Rs.129600	(5.2%)	(8.8%)	(5.4%)	(19.4%)
	Rs.129601-Rs.231000	47 (4.4%)	86 (8.0%)	84 (7.8%)	217 (20.1%)
	Rs. 231001 and more	52 (4.8%)	93 (8.6%)	70 (6.5%)	215 (19.9%)

Source: Compiled by the Author

4.2. Household Healthcare Expenditure: Public versus Private Health Care Facilities:

Both public and private health care providers are available across the state for different essential health care services. For various ailments, people from rural areas can utilize the services from either type of provider. During the survey, information on provider visited for treatments and the frequency of these visits by the household members were collected with the help of the interview schedule. For IP and death cases, a recall period of 365 days/12 months was considered. On the other hand, a recall period of 30-31 days/1 month was finalized for OP cases. The summary of this information can assist us in recognizing the basic healthcare utilization pattern of the rural population of Assam amid public and private health care facilities. Hence in the following table (Table 14), all the treatment cases (IP, OP, and death) reported by the sample households are segregated into three separate groups based on the type of provider visited (public, private, and mix of both public and private) for treatment. During the household survey, the reported number of IP, OP, and death cases (due to medical reasons) are 681, 1076, and 66, respectively.

Table 14: Segregation of reported ailment treatment cases based on the type of provider visited

Reported Cases		Nalbari (%)	Darrang (%)	Morigaon (%)	Total (%)
IP Cases	No of IP cases in a public facility	65 (49.24)	218 (68.77)	152 (65.52)	435 (63.88)
	No of IP cases in a private facility	57 (43.18)	80 (25.24)	61 (26.29)	198 (29.08)
	No of IP cases in both public & private facility	10 (7.58)	19 (5.99)	19 (8.19)	48 (7.04)
	Total No of IP cases	132 (100)	317 (100)	232 (100)	681 (100)
OP Cases	No of OP cases in a public facility (in a month)	181 (61.36)	306 (58.73)	142 (54.62)	629 (58.46)
	No of OP cases in a private facility (in a month)	104 (35.25)	202 (38.77)	110 (42.31)	416 (38.66)
	No of cases in both public & private facility	10	13	8	31

	(in a month)	(3.39)	(2.50)	(3.07)	(2.88)
	Total No of OP cases	295 (100)	521 (100)	260 (100)	1076 (100)
Death Cases	No of death cases during or post-treatment in a public facility	2 (40)	22 (91.67)	24 (64.86)	48 (72.73)
	No of death cases during or post-treatment in a private facility	1 (20)	2 (8.33)	10 (27.03)	13 (19.69)
	No of death cases during or post-treatment in both public & private facility	2 (40)	0 (0)	3 (8.11)	5 (7.58)
	Total No of death cases during or post-treatment	5 (100)	24 (100)	37 (100)	66 (100)

Source: Compiled by the Author

According to Table 14, 63.88% of the total IP cases, 58.46% of the total OP cases, and 72.73% of the total death cases were treated in a public facility solely. Irrespective of the type of treatment, the physicians of public facilities attended the majority of the reported cases for the rural households. Although the reported visits to private facilities are somewhat lower than that of public facilities, we cannot overlook it entirely. Each visit, either to the public, private, or both, contribute to the households' health expenses. There are episodes of treatment reported with patients of the sample households visiting both types of providers, but it is very few for IP, OP as well as death cases. The distribution of reported cases in public and private providers for the three selected districts also resembles the pattern for the entire sample.

In this section, an attempt has been made to estimate generally how much a rural household has to pay for healthcare in a year. Then the annual household expenditure for healthcare has been further segmented according to the type of providers visited for treatment to assess any difference expenses.

4.2.1. Estimation of OOP Health Expenses and Distribution:

The total healthcare costs comprise two types of expenses; direct and indirect costs. To estimate the total healthcare expenditure incurred in the previous 365 days, initially, the following healthcare cost information is extracted for each of the sample households under the following two headings:

A. Direct cost components:

(i) Inpatient (IP) cost for the household for the past 12 months, comprising of service fees (doctors' pay, the price for the hospital-bed, cost of OT), costs of diagnostic tests, and medicines and other consumables

(ii) Outpatient (OP) cost incurred by the households in the latest 30 days (or in the last month). Based on the probability of the occurrence of yearly OP visits, following the pattern of the past 30 days, the monthly cost is further converted to the annual cost. The OP cost is computed by summing up the following three cost categories:

- Consultation/Service fees
- Cost of diagnostics tests and
- Cost for medicines

(iii) The treatment cost paid by household in the past 12 months for a member, who died during or post-treatment

(iv) The constant amount paid by the households every month on healthcare with or without prescription and self-medications: This component of the household's healthcare cost is multiplied by 12 for converting to an annual cost term.

B. Indirect cost components:

(i) Food and lodging costs incurred for the patient as well as the attendant(s) during the treatment period for each of the reported IP case(s) and the reported OP visits.

(ii) Transportation costs spent by the households for taking the patient to the health care provider and bringing back home for notes IP and OP cases.

(iii) Informal payments (if any) made during all the stated IP and OP records for the past 365 days.

The respective indirect cost values associated with the OP visit(s), similar to the OP direct cost estimation, are converted to annual cost using the probability of occurrence. After making the necessary conversions, the different direct and indirect cost components separately added up to estimate the annual direct and indirect healthcare costs for a household. Finally, by adding direct and indirect expenses, the annual healthcare costs for families are estimated.

The estimated households' OOP health expenditures have a non-normal distribution; the data set have many outliers. Hence, instead of arithmetic mean, positional average values (i.e., median) and inter-quartile range (IQR) has been used to interpret the data more appropriately. From the table below (Table 15), it has been observed that the median value (i.e., the positional average values) for household OOP health expense for the whole sample as well as across the sample districts is significantly

high. In addition to that, the IQR for the three cost values verify that the health expenses across the sample have a wide spread, even after excluding the outliers. It confirms the presence of a high degree of variability in OOP expenses. The results are also equally disturbing for the sub-components of households' direct cost, i.e., IP cost and OP costs. The median value for IP cost for a family in a year is approximately Rs. 5,000 (with IQR of Rs. 27,450), and the MEDIAN value for OP costs in a month is Rs. 1000 (with a IQR of Rs 2,600). This high volatility of OOP expenses points out the irregularity of health care expenses across the sample. Such abnormalities might be due to the severity of the various illnesses under treatment. As we all know that the cost of treatment for severe diseases is very high, a significant number of cases of critical illness can widen the range of health expenses to a great extent. So, these high variabilities in the different cost components refer to the presence of a significant number of critical cases among the different reported cases.

Table 15: OOP Expenditure for Households: Descriptive Statistics

Cost Components	Statistical Measures		Nalbari	Darrang	Morigaon	Total
OOP Direct	Median (Rs.)		26692	31847.50	38566.67	31100
	Inter Quartile Range (Rs.)	Q1	10900	9025	8128	9238
		Q3	83817	76805	76805	85049
	Minimum (Rs.)		600	61	61	61
	Maximum (Rs.)		766200	3137417	6730971	6730971
OOP Indirect	Median (Rs.)		2145	4560	5000	4000
	Inter Quartile Range (Rs.)	Q1	0	178	243	973
		Q3	7815	12840	13067	12100
	Minimum (Rs.)		0	0	0	0
	Maximum (Rs.)		42967	862650	328750	862650
OOP Total	Median (Rs.)		29043	37727	45065	37149
	Inter Quartile Range (Rs.)	Q1	13395	10000	11505	11916
		Q3	90754	94030	115798	100450
	Minimum (Rs.)		600	61	600	61
	Maximum (Rs.)		82221	4000067	6865924	6865924

Source: Compiled by the Author

Considering the deviation in the estimates OOP expenses, basic descriptive statistics might not be sufficient to quantify the financial burden of health care costs. Hence, we have also estimated the per capita cost for the sample to check the extent of financial strain exerted on each member as a result of various health care treatments. The table below (Table 16) represents the details of the per capita health expenses, and it is alarmingly high. According to the estimation for the entire sample for a year, per capita direct cost, indirect cost and total health care cost is Rs. 18,219.50, Rs. 2,752.57, and Rs. 20,972.07 respectively. On the other hand, the per capita income for the whole sample is approximately Rs. 33,479; same for the sample districts: Nalbari, Darrang and Morigaon are around Rs. 32,895, Rs. 34,974 ad Rs. 31,930 respectively. The comparison between per capita income and per capita OOP expenses distinctly shows that, with respect to the study sample, the financial burden of health expenses for an individual in a year is equivalent half of his/her annual income.

Table 16: Per Capita OOP Healthcare Expenditure (in a year)

	per capita OOP expenses			
	Nalbari	Darrang	Morigaon	Total
Direct Cost	15,845.22	15,577.17	20,744.91	18,219.50
Indirect Cost	2,115.27	1,911.87	2,546.14	2,752.57
Total Cost	17,960.50	17,489.04	23,291.05	20,972.07

Source: Compiled by the Author

Table 17: Descriptive Statistics for Cost of Treatment for IP cases (in a year) and OP cases (in a month)

		IP Cost (Public facilities)	IP Cost (Private facilities)	OP Cost (Public facilities)	OP Cost (Private facilities)
Median (Rs.)		2500	45000	5	1600
Inter Quartile Range (Rs.)	Q1	0	20000	0	600
	Q2	125	80000	5	3500

Source: Compiled by the Author

The type of healthcare provider visited highly influences households' annual cost of treatment because of the difference in pricing. The data shows that an enormous difference exists between the various cost values between public and private healthcare facilities. According to the collected data, the IP and OP cost in private facilities is more than twice the IP as well as OP cost of treatment in any public facility (Table 17). While comparing the healthcare costs in public and private facilities, one thing must be mentioned that for IP cases most of the times there is one point of payment. The

households have to pay the entire cost of treatment to the healthcare facility where the family member got admitted. It includes the service fees, costs of diagnostic tests, as well as medications/consumables, and the costs for the outsourced services as well (if any). But in case of OP visits after the consultation with the physician/health care specialist, the household member(s) has the liberty to some extent to utilize the health care facility providers of their preference for the recommended diagnostic tests and medications. Therefore, a thorough analysis of OP cost components for the type of facility provider visited is also essential to get an overall idea of shares of cost components.

Table 18: Descriptive Statistics for Out-Patient Visit Costs (for recall period of 30 days)

Statistical Measures		Consultation fees	Cost of diagnostics tests	Cost for medicines
Median (in Rs.)		5	1200	1000
Inter Quartile Range (in Rs.)	Q1	5	500	900
	Q3	500	2500	3500

Source: Compiled by the Author

Table 19: Descriptive Statistics for Out-Patient Visit Costs in Public & Private Facilities (recall period: 30 days)

Type of Provider		Public			Private		
Statistical Measures		Consultation fees	Cost of diagnostics tests	Cost for medicines	Consultation fees	Cost of diagnostics tests	Cost for medicines
Median (in Rs.)		5.00	250.00	0.00	300.00	1500.00	1088.00
IQR (in Rs.)	Q1	5.00	650.00	500.00	500.00	3500.00	2500.00
	Q3	5.00	650.00	500.00	500.00	3500.00	2500.00

Source: Compiled by the Author

The table below (Table 18) demonstrates, on average, how much a rural household has to pay for a consultation with the physician(s), diagnostics tests, and medicines, in a month. The positional average for consultation fee paid by a household in a month is Rs 5, since most of households first preference for OP consultation was the

public healthcare providers. On the other hand, the median of diagnostic tests and medicines are Rs 1200 and Rs 1000, respectively. But to confirm any discrepancy in health care cost between public and private facilities, the OP cost components value in both type facilities are compared through basic descriptive statistics (Table 19). The respective positional average values for cost in public and private facilities from Tables 18 have highlighted the disparity between the two types of providers. According to the median values from Table 19, the cost for the consultation, medical test, and medications are drastically high in private facilities compared to that of public facilities. The study findings also endorse the common notion that treatment in private facilities costs dearly in comparison with public facilities.

To substantiate the perception that private healthcare facilities are costlier, we have further carried out a series of independent sample t-test[20] to check if there is any significant difference in OOP costs concerning the different types of health care providers visited. Six hypotheses are formulated and put them to test to compare the means for IP treatment cost (in a year), and OP treatment costs (for a month) against types of the provider (public, private, or both) where the households' have availed treatment for the mentioned period. The respective hypotheses and their outcomes have been tabulated below (Table 20).

Table 20: Independent Sample T-test Results

Sl. No		Hypothesis	Levene's Test for Equality of Variances	T-Test Statistics			Result
				t	Sig (2-tailed)	Mean Difference	
1	H_0	There is no significant difference between the average IP treatment cost for households availing treatment in public facilities and that for households without any treatment case in public	Equal variances not assumed	-2.587	.010	-14330.52	H_0 rejected

[20] According to Lumley, Diehr, Emerson, and Chen (2002), t-tests and linear regressions are valid for any distribution in case large samples, specifically for health-related data. Hence, despite having a non-normal data set, t-tests and ANOVA tests are used for identifying the relationships between different variables and determine the extent of variability with fixed/random effects, respectively.

		facilities					
2	H_0	There is no significant difference between the average IP treatment cost for households availing treatment in private facilities and that for households without any treatment case in private facilities.	Equal variances not assumed	7.009	.000	64134.77	H_0 rejected
3	H_0	There is no significant difference between the average IP treatment cost for households availing treatment in both public and private facilities and that for households without any case of availing treatment in both public and private facilities.	Equal variances not assumed	2.749	.013	74115.37	H_0 rejected
4	H_0	There is no significant difference between the average OP treatment cost for households availing treatment in public facilities and that for households without any treatment case in public facilities	Equal variances not assumed	-3.473	.001	-1343.60	H_0 rejected
5	H_0	There is no significant difference between the average OP treatment cost for households availing treatment in private facilities and that for households without any treatment case in private facilities.	Equal variances not assumed	7.064	.000	2780.32	H_0 rejected
6	H_0	There is no significant difference between the average OP treatment cost for households availing treatment in both public and private facilities and that for households without any case of	Equal variances assumed	.873	.383	1314.65	H_0 accepted

		availing treatment in both public and private facilities.					

Source: Compiled by the Author

Based on the results from Table 20, we have drawn the following inferences.

- Hypothesis 1: Here, it has been found that the average IP treatment cost for households availing treatment in public facilities is significantly lower (by Rs. 14330.52) than the average IP treatment cost for houses without any treatment case in public facilities.
- Hypothesis 2: The independent sample t-test has established that the average IP treatment cost for households availing treatment in private facilities is higher for households without any treatment case in private facilities. The mean difference shows that IP treatment cost is Rs. 64134.77 more in private facilities.
- Hypothesis 3: The t-test has verified the statistically significant difference between average IP treatment cost for houses availing treatment in both public and private facilities that for households without any case of availing treatment from both type of providers. The IP treatment cost is estimated to be Rs. 74115.37 more for families that have availed treatment in both public and private facilities.
- Hypothesis 4: The mean comparison shows that OP treatment cost for households availing treatment in public facilities is significantly less (by Rs. 1343.60) than the OP cost for houses without any treatment case in public facilities.
- Hypothesis 5: The result has confirmed that there is a significant difference between the average OP treatment cost for households availing treatment in private facilities and that for houses without any treatment case in private facilities. The cost of OP treatment is Rs. 2780.32 more for private providers.
- Hypothesis 6: According to the t-test results, we accepted the null hypothesis (H_0), i.e., there is no statistically significant difference between average OP treatment cost for households availing treatment in both public and private facilities and that for houses without such cases. This could be because the share of OP visits to both public and private facilities is very few compared to total number of OP visits reported during the survey.

From the above-mentioned independent sample t-test results, it is evident that in the presence of treatment cases in private facilities irrespective of the type of treatment (IP/OP), the cost of treatment increases many folds. The cost of treatment in public and

private facilities stands at the extreme ends. The public health care facilities are cheaper for treatment since they are supposed to be affordable for everyone, but what is more alarming is that the cost of treatment is exceptionally high in private facilities. Although the descriptive statistics show a greater number of reported cases in public healthcare providers, with most of the follow-up expenses incurred in private facilities, the share of OOP expenses incurred in private facilities more than double in compared to OOP expenses in public facilities. In short, private health care facilities squeeze out a hefty amount of money from rural households.

4.2.2. OOP Health Expenditure and Influencing Factors:

The previous section has already established a high variability across the households for the households' estimated annual health expenditure. One obvious reason for such variation is the type of provider visited for healthcare treatments, but that could not be all. There must be certain other factors that are in force influencing the amount of the households' OOP expenses. To understand the wide variation in healthcare expenses, it is essential to figure out what are the factors that determine the extent of a household's health expenses. A detailed understanding of these deciding factors would help us in addressing the issue of high OOP health expenses more systematically and effectively. So, initially, a series of correlation tests have been carried out to identify the different factors that influence the direct OOP expenses for a household. Three sets of variables have been considered for this purpose; (a) household demographics (b) disease/treatment pattern and (c) health care cost components for estimating the Spearman rho correlation coefficient (since the shortlisted variables violated the assumption of linearity). The results of these correlation tests are summarized below.

(a) Household Demographics:

The correlation test confirms that a household's annual OOP health expenditure is less influenced by the size of the family, as the analysis shows a rather weak relationship ($r = 0.150$) between the number of household members and the estimated annual OOP health care expenses for the households. Usually, there is an assumption that infants and senior members of the families are more prone to illness, and thus their presence significantly contributes to household health expenses. Hence, it is a common belief that the count of infant and senior members in a family is likely to have a relationship with the OOP expenses. But the Spearman Correlation coefficient negates this notion. The test shows there is no significant relationship between direct OOP cost and headcount of

infants in a household, and for senior citizens in a family, the identified weak association (r = 0.108) can be easily ignored. Affordability is one of the significant barriers to health care access, and many times due to the inability to pay for health care services, households have delayed even compromised the treatments. The positive but weak association (r = 0.172) between the household's yearly income and household's annual health expenses might be an indication of the issue of affordability in the utilization of healthcare services. If earnings are high, families can spend more for better or complete treatments, otherwise not.

(b) Disease/Treatment Pattern:

Chronic diseases demand for continuous treatment in different forms. The presence of chronic cases in a household calls for constant healthcare expenses at a regular interval. The magnitude of such expenditures might vary case wise due to several factors like the severity of the condition, affordability, and many more. According to the correlation test results, the direct OOP expenses for households' have a weak positive association with the number of chronic cases (r = 0.284) as well as with the number of chronic patients (r = 0.279) in the households. Moreover, a moderately positive relationship (r = 0.368) has been detected between the number of IP cases in a family and household's direct OOP health expenses in a year. In general, it has been observed that families have to spend a significant amount of money for IP cases, but the prospects of IP episodes are usually not very high. It might be the reason due to which the strength of the association between IP case counts and OOP health expenses is not as high as one anticipates. On the other hand, the high frequency of OP cases, compared to IP or death cases, explains the positive and moderate association (r = 0.411) between the number of OP cases reported in a month and households' annual OOP health expenses. The death count in a family in a year also has a positive association with the household's OOP health expenses, but the strength of this association is weak (r = 0.195). The survey found only 66 death cases caused by medical conditions or pre/post/during medical treatment, and descriptive statistics show that on average, there are only 0.0611 such death cases in a household in a year with a standard deviation of 0.2435. So, the weak association between death counts and OOP health expenses for a house might be due to the low incidence of these death cases amidst the sample households.

(c) Health Care Cost Components:

Total household OOP healthcare expenditure is composed of different cost components, and the shares of those cost components are different from one another, which also varies from case to case. IP cost of treatment seemed to have a moderately positive association (r = 0.583) with direct OOP cost. When the IP cost of treatment in public facilities is considered for the correlation test, it showed a weak positive relationship (r = 0.324) with the household's annual health care costs, quite low in comparison overall IP cost of treatment and OOP expenses. The healthcare services being very much cheaper in public facilities as compared to private ones should be the reason for such weak relations. Thus, with the high cost of treatment for IP cases in the private facilities, the strength of association significantly improves from weakly to moderately positive (r = 0.602). In comparison to IP cases, OP care is more common for every household, and its contribution to households' annual expenses is more significant most of the time. The strong positive association (r = 0.782) between OP cost of treatment and annual OOP expenses also confirms it. However, if the correlation test is run for OP expenses in public and private facilities separately, the public-private disparity in the cost of treatment becomes more evident. While OP treatment expenses in public facilities have a pretty weak influence (r = 0.097) on families' annual health expenses, OP cost of treatment in private facilities has a strong and positive relation (r = 0.755) with the year-long OOP expenses for the households. Again, comparing the test results for the three components of OP cost of treatment, service fees/consultation fees influence households' OOP expenses (in a year) moderately (r = 0.331). In contrast to this, the cost of diagnostic tests (r = 0.6488) has a slightly strong association with OOP expenses, and the cost of medicine for OP visits (r = 0.783) shares a strong association with household' direct OOP costs.

On further segregating the healthcare costs for death cases for the different types of healthcare providers, a weak positive association has been identified between the total OOP cost values and treatment cost in public (r = 0.330). For treatment costs in private facilities resulting in the death of a family member, the association is relatively weaker (r = 0.266). We've also observed that there are a considerable number of households spending a constant amount of money on medication/diagnostic tests with or without any prescriptions due to certain chronic conditions or some long-term illness whose treatment is ongoing. Such expenses differ from one house to another, due to different causes as mentioned earlier. Hence, although such costs share a fixed proportion for each

household's annual health expenses, the association between these two costs is also found to be moderate (r = 0.603).

The reported associations between the direct OOP expenses and the different relevant variables have facilitated the identification of the most influencing variables. So, with the help of the correlation test results, further categorization of these determinants can be carried out, based on their impact (strength of association). Such categorization could be used further in setting priorities to address the issue of high OOP expense. The presence of high public-private discrepancy is quite alarming, and appropriate measures need to be implemented to minimize the gap. As it has been observed that IP treatment has been given the highest priority to date in the different social security schemes, public health schemes, or government-funded health insurance schemes, and the OP care doesn't receive much importance. It is clear from the results that the cost of medication and diagnostics tests influences the magnitude of the households' OOP the most, and taking the impact into account, it is quite clear that these costs can induce financial strain on the family if not controlled adequately. Following the rising trend of OP cost of treatment, proper measures are currently the need of the hour to address the issue at hand in the best manner. The problem of affordability for healthcare will eradicate, only if we handle these determinants in the best way.

4.3. Health Financing Pattern for Household Healthcare Expenses:

In recent times, high out-of-pocket health expenditure is a burning issue for India, so for Assam as well. It has been already established that irrespective of the type of provider visited (public/private), a large share of household healthcare expenses has to be paid straight out of the pockets of the household members. At times, a households' earning might not suffice the healthcare expense requirements due to many reasons like low income, shortage of money at the time of treatment, high cost of treatment, etcetera. Hence, many households have to resort to other alternatives to meet financing needs alongside their income money. There are several such financing options available to cover up the financing gap. However, the adequacy of these measures is still debatable.

4.3.1. Different Financing Measures and Their Distribution Pattern:

The financing measures commonly available for and used by the rural households include savings money, sale of available assets, borrowing from family/friend or moneylenders, credit from SHG/MFI/other FIs, and financial assistance from health

scheme/health insurance. The households may take up any one or combination of two or more of these alternatives for financing their health care expenses. The following table (Table 21) summaries the reported financing measures adopted by rural households across the sample in the previous 12 months.

From the above table (Table 21), it is observed that when it comes to paying for health care rural households mostly choose to pay out of their income (98.3%), and if that's not enough, they are used to utilizing their savings (88.3%) for the purpose. Apart from these two, according to the table, using financial credit from SHGs/MFIs or any other such financial institutions (FI) (41%) for different healthcare needs is presently very common in the rural settings. The main reason for promoting the SHG model as well as MFIs across the globe was to provide easy access to financial services like savings and microcredit to the population with very little paperwork, specifically for those who are often left out by the big public/private sector FIs. Here, from the frequency table, it looks like the rural households are extensively benefiting from this micro-credit facility in cases of medical treatments. But we can't ignore the fact that these households are not utilizing this micro-credit facility exclusively for health care expenses only. At the time of need, they borrow money from SHGs/MFIs for other essentials as well. Multiple microcredits increase the risk for over-indebtedness, which means instead of assistance, micro-credit from SHGs/MFIs might cause financial strain for rural households. Borrowing from relatives/friends (38%) is another way of financing healthcare expenses commonly reported by rural households during the survey. From the reported treatment cases, it has been observed that there are two types of borrowing from relatives/friends; one is where you've to pay interest above repayment of the principal sum, and for the other one, no need to pay anything more. Hence, the distribution of these two types of borrowing patterns has also been included in the study to find out which method is more frequently adopted by the households (Table 22). Reported data shows that the cases of borrowing from relatives and friends without any interest are much more than the borrowing cases from friends/relatives with interest.

Table 21: Frequency Distribution for the adoption of different financing measures

Financing Measures	Nalbari		Darrang		Morigaon		Total	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
Current income of any household members	**265 (98.1)**	5 (1.9)	**485 (99)**	5 (1)	**312 (97.5)**	8 (2.5)	**1062 (98.3)**	18 (1.7)

Savings (e.g., bank account etc.)	**239 (88.5)**	31 (11.5)	**462 (94.3)**	28 (5.7)	**253 (79.1)**	67 (20.9)	**954 (88.3)**	126 (11.7)
Payment or reimbursement from a health insurance plan/health scheme	1 (0.40)	269 (99.6)	11 (2.2)	479 (97.8)	11 (3.4)	309 (96.6)	23 (2.1)	1057 (97.9)
Sold items/Sale of Assets (e.g., furniture, animals, ornaments, furniture)	39 (14.4)	231 (85.6)	128 (26.1)	362 (73.9)	90 (28.1)	230 (71.9)	257 (23.8)	823 (76.2)
Borrowed from family members or friends from outside the household	120 (44.4)	150 (55.6)	186 (38)	304 (62)	**125 (39.1)**	195 (60.9)	431 (39.9)	649 (60.1)
Borrowed from someone other than a friend or family (e.g., moneylenders)	29 (10.7)	241 (89.3)	64 (13.1)	426 (86.9)	52 (16.3)	268 (83.8)	145 (13.4)	935 (86.6)
SHGs/MFIs & other FIs	**153 (56.7)**	117 (43.3)	**199 (40.6)**	291 (59.4)	91 (28.4)	229 (71.6)	**443 (41)**	637 (59)

Source: Compiled by the Author

Table 22: Frequency Distribution of Borrowing Pattern from relative/friends

Borrowed from family members or friends from outside the household	Nalbari		Darrang		Morigaon		Total	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
With interest	5 (1.9)	265 (98.1)	42 (8.6)	448 (91.4)	42 (13.1)	278 (86.9)	89 (8.2)	991 (91.8)
Without interest	**56 (20.7)**	214 (79.3)	**117 (23.9)**	373 (76.1)	**73 (22.8)**	247 (77.2)	**246 (22.8)**	834 (77.2)

Source: Compiled by the Author

The above frequency distribution tables have helped in identifying how a rural household finance its health care expenses out of the different alternatives available. The study has already established that OOP health expenses are indeed very high in the region, and it is well-known that high financial risk often follows the high OOP health expenses. In that case, only identifying the preferred financing measures won't be sufficient. Hence apart from the adoption pattern for different financing measures, we also need to explore to what extent (in monetary terms) the households have put these measures to use in the rural areas. It will give us an idea of how the different patterns are likely to influence the situation. Based on the data extracted from the survey, for each type of financing measure mean, the standard deviation and range of expenses have been estimated separately for IP, OP, and death cases of treatment (Table: 23, 24 and 25).

Although the study suggests that household income is the first pick in the rural setting, in the case of IP treatments, on average, a household pays only Rs. 2433.94 (with a very high standard deviation of Rs. 10951.33), which is the lowest mean among all the

alternatives (Table 23). It might be the indication of the insufficiency of household income to fulfill the healthcare needs. As a result, it usually leads to the exhaustion of a large amount of household savings for different treatment costs. According to the study, the average amount of credit taken from SHG/MFIs is considerably high as well, slightly higher than the average amount of savings amount used to pay for the household's healthcare needs. The spread for credit from SHG/MFIs is alarmingly high, and it further confirms the high risks of high indebtedness leading the way to over-indebtedness. On the other hand, every household doesn't possess a large asset base to use it as collateral for borrowing or sell it off, and this explains the relatively lower mean, but a considerably high standard deviation. However, the vast spread of financing amounts utilizing household assets proves that high OOP expenses can make a household highly susceptible to asset loss, which also likely to intrude on the households' economic position. Since only a few numbers of families have benefited from any health insurance or health scheme, the average amount of financial assistance availed under any plan is not that significant. But its range proves that those, who have availed services under such schemes, have received a considerable amount of financial relief, scattered amidst the sample households.

Table 23: Descriptive Statistics for the different financing measures adopted for the IP cases

Financing Measures	Mean (Rs.)	Std Dev (Rs.)	Range (Rs.)
Current income of any household members	2,433.94	10,951.31	145,400.00
Household Savings	10,932.24	32,402.86	377,500.00
Sold items/Sale of Assets	6,738.34	43,867.22	855,000.00
Borrowing from relatives/friends (with interest)	3,277.69	22,136.51	410,000.00
Borrowing from relatives/friends (without interest)	9,732.58	27,679.47	300,000.00
Borrowing from moneylenders	2,924.21	15,658.10	160,000.00
Payment or reimbursement from a health insurance plan/health scheme	1,347.18	10,113.67	155,000.00
Credit from SHGs/MFIs & other FIs	12,400.71	33,160.89	450,000.00

Source: Compiled by the Author

Although the number of reported death cases due to any medical condition during or post-treatment is not very high, the incidence of high OOP health expenses is indeed very high. It, in turn, increases the pressure of funding the treatment cost from different sources available. The available primary data demonstrate a different pattern of financing for such death cases. The households with death cases seemed to utilize credits from SHG/MFIs most to finance the treatment cost (highest mean as well as dispersion). Along

with that, the average amount of money paid for such treatment through household savings, asset sale, and borrowings from relatives/friends (without interest) is almost similar. The contribution of different health schemes/insurances is not very significant for households with such death cases.

Table 24: Descriptive Statistics for the different financing measures adopted for the death cases

Financing Measures	Mean (Rs.)	Std Dev (Rs.)	Range (Rs.)
Current income of any household members	2332.31	4793.55	25000.00
Household Savings	24753.85	60480.05	300000.00
Sold items/Sale of Assets	23884.62	23884.62	250000.00
Borrowing from relatives/friends (with interest)	11846.15	42825.31	315000.00
Borrowing from relatives/friends (without interest)	22000.00	46737.30	245000.00
Borrowing from moneylenders	5555.56	19178.93	130000.00
Payment or reimbursement from a health insurance plan/health scheme	1031.25	6922.97	55000.00
Credit from SHGs/MFIs & other FIs	30923.08	80136.27	450000.00

Source: Compiled by the Author

Table 25: Descriptive Statistics for different financing measures adopted for the OP cases (recall period 30 days)

Financing Measures	Mean (Rs.)	Std Dev (Rs.)	Range (Rs.)
Current income of any household members	965.39	1759.19	11500.00
Household Savings	706.70	2029.99	21600.00
Sold items/Sale of Assets	157.49	1369.57	23100.00
Borrowing from relatives/friends (with interest)	346.25	2817.66	50000.00
Borrowing from relatives/friends (without interest)	502.67	2339.69	32000.00
Borrowing from moneylenders	32.78	471.75	11000.00
Credit from SHGs/MFIs & other FIs	836.01	4236.74	80000.00

Source: Compiled by the Author

For the OP cases too, mostly the households use household income and savings (Table 25) to cover the total cost of treatment. Due to the lack of money during treatment, families utilized borrowings from relatives/friends, or credits from SHG/MFIs to match the needs. For a recall period of only 30 days, the dispersion for loans from SHG/MFIs for treatment is already very prevalent. For the year-round OP visits costs, these credit amounts are highly likely to increase multiple-folds, which is very alarming in terms of financial strain provoked by such microcredits. Since the different available health insurance or schemes cover a specific range of IP cases only, it has no role in OP treatment financing. In addition to all these, we must note that for all three types of

treatment cases (Table 23, 24, and 25), the moneylenders do not seem to have any significant role as a financing tool for health care expenses among rural households.

4.3.2. Factors Influencing the Adoption of Different Financing Alternatives

The above segment has established a scattered pattern across the state concerning the various financing alternatives. Hence, it is very much essential to identify the factor(s) which causes such dispersion on the adoption of different available measures. There may be several factors in an action affecting the households' financing decisions. Two sets of variables, representing the household demographics and illness treatment patterns, are most likely to influence these decisions. So, at first, several hypotheses are formulated and tested using the Chi-Square test statistics to check whether various demographics of the households share any association with families' financing strategies. The statistically significant results from the tests are listed in the table below (Table 26).

Table 26: Chi-Square Test Results (financing measures adopted vs. household demographics)

Sl. No		Hypothesis	Value	Sig	Result	Strength of Association (phi coefficient/ Cramer's V)
1	H_0	There is no association between the adoption of the sale of assets as a financing measure and the income level of the household.	19.011	0.001	H_0 is rejected	0.133 (Moderate)
2	H_0	Borrowing from friends and relative is independent of the households' income group.	9.837	0.043	H_0 is rejected	0.095 (Weak)
	H_0	Borrowing from friends and relative without interest is independent of the households' income group.	9.907	0.042	H_0 is rejected	0.140 (Moderate)
3	H_0	Borrowing from a moneylender to finance the healthcare expenses is independent of the households' income group.	21.308	0.000	H_0 is rejected	0.096 (Weak)
4	H_0	Availing financial assistance from SHGs/MFIs or any other FIs for healthcare expenses is not connected with the households' income level.	18.023	0.001	H_0 is rejected	0.129 (strong)
5	H_0	Selection of SHG or other FIs as financing measure is independent of the household's geographic location (district).	48.29	0.000	H_0 is rejected	0.211 (Strong)
6	H_0	The utilization of savings for	43.54	0.000	H_0 is	0.201

			financing health expenses is not associated with the household's geographic location (district).			rejected	(Strong)
7	H_0		There is no association between the adoption of the sale of assets as a financing measure and the household's geographic location (district).	17.79	0.000	H_0 is rejected	0.128 (Moderate)
8	H_0		Households benefited by financial assistance under health scheme or health insurance plan and households' geographic location (district) are independent of each other.	6.67	0.038	H_0 is rejected	0.079 (Weak)
9	A	H_0	Borrowing from family, friends outside the household (with interest) to finance the healthcare expenses is not associated with the households' geographic location (district).	24.741	0.000	H_0 is rejected	0.151 (Strong)
	B	H_0	Borrowing from family, friends outside the household (without paying interest) to finance the healthcare expenses is independent of the households' geographic location (district).	0.974	0.614	H_0 is not rejected	-
10	H_0		Availing financial assistance from SHGs/MFIs or any other FIs for healthcare expenses is not connected with the households' religion	6.391	0.011	H_0 is rejected	0.077 (Weak)
11	H_0		The utilization of savings for financing health expenses is independent of the social group of the household.	17.972	0.000	H_0 is rejected	0.129 (moderate)
12	H_0		There is no association between the adoption of the sale of assets as a financing measure and the household's social group.	12.170	0.007	H_0 is rejected	0.106 (Moderate)
13	H_0		Borrowing from a moneylender to finance the healthcare expenses is independent of the households' social group.	9.559	0.023	H_0 is rejected	0.094 (Weak)
14	H_0		Availing financial assistance from SHGs/MFIs or any other FIs for healthcare expenses and the social group of households' members are not associated with each other.	34.833	0.000	H_0 is rejected	0.18 (Moderate)
15	A	H_0	Borrowing from family, friends outside the household to finance the healthcare expenses is independent of the households'	17.001	0.002	H_0 is rejected	0.125 (Moderate)

			family size.				
	B	H_0	There is no association between borrowing from family, friends outside the household (without paying interest) to finance the healthcare and the family size of the household.	10.336	0.035	H_0 is rejected	0.098 (Weak)
	C	H_0	Borrowing (with interest) from family, friends outside the household to finance the healthcare expenses is independent of the family size of the household.	Invalid			

Source: Compiled by the Author

The strength of the established association is determined using the phi coefficient and Cramer's V correlation[21]. There are five categories to define the strength of association; very strong, strong, moderate, weak, and very weak or no association (Akoglu, 2018). According to the table above (Table 26), the geographic location of the sample households has a strong association with three of the available financing measures: availing credit from SHG/MFIs, use of saving money, and borrowing from relatives/friends (with interest) for health expenses. On the other hand, selling off the asset(s) by the households for medical treatments has a moderate association with the household's geographic positioning in the state, and a weak association detected with the financial assistance received under any health scheme. The adoption pattern for these financing measures is heterogeneous in nature; it varies widely across the districts. Among all these, we have also noticed that relying on relatives and friends for financial assistance in the time of need is very common among rural households irrespective of their geographic locations.

A weak association is detected between the household's religion and availing financial assistance from different SHGs or MFIs for health care needs. Similarly, the social group of families also seems to have a moderate influence on the decision to use savings money, sale of asset(s), and to use credits from SHGs/MFIs to finance the health care costs of the households. There is a weak association between the social group of families and borrowing patterns from moneylenders to accommodate the health care

[21] Phi coefficient is a measure for the strength of an association between two categorical variables in a 2 × 2 contingency table and its value varies between 0 and 1. Cramer's V is an alternative to phi for contingency tables bigger than 2 × 2 tabulation. The Cramer's V value also varies between 0 and 1 without any negative values.

needs of the houses. It implies that the social and religious beliefs of members of rural households can persuade households' financing measure adoption decisions. In addition to that, the chi-square test has shown that the family size also has a moderate association with borrowing from friends and relatives as a health care financing measure.

Similarly, for the second set variables about the disease/treatment pattern of the households, another series of hypotheses are tested to identify if there is an association between those variables and the households' financing measure adoption pattern. Chi-Square test statistics are used for this purpose as well, and the statistically significant results from the test are summarized below (Table 27).

Table 27: Chi-Square Test Results: Financing measures adopted vs. health condition and treatment pattern

Sl. No			Hypothesis	Value	Sig	Result	Strength of Association (phi coefficient/ Cramer's V)
1		H_0	There is no association between the death of a family member due to medical reasons during or post-treatment in the last 365 days and the adoption of asset selling as a financing tool by the household.	24.67	0.000	H_0 is rejected	0.151 (Strong)
2		H_0	The deaths of any family member due to medical reasons during or post-treatment in the last 365 days and financing from the moneylender for household health needs are not interrelated.	3.916	0.048	H_0 is rejected	0.060 (Weak)
3	A	H_0	Borrowing (without any interest) from family, friends outside the household to finance the healthcare expenses is independent of the event of a death in the households' due to medical reasons.	37.954	0.000	H_0 is rejected	0.187 (Strong)
	B	H_0	Borrowing (with interest) from family, friends outside the household to finance the healthcare expenses is independent of the event of a death in the households' due to medical reasons.	24.524	0.000	H_0 is rejected	0.151 (Strong)

4		H_0	The presence of any chronic conditions in a household and the utilization of savings to support the household's healthcare needs are independent of one another.	3.941	0.047	H_0 is rejected	0.060 (Weak)
5		H_0	Availing credit from SHG/MFI or other FIs financing the health care expenses is independent of the presence of any chronic conditions in a household.	7.400	0.007	H_0 is rejected	0.083 (Weak)
6		H_0	Incidence of IP cases and usage of household savings for health care requirements are not associated with each other.	25.021	0.000	H_0 is rejected	0.152 (Strong)
7		H_0	There is no relationship between the occurrence of IP cases in the households and whether a household benefitted from financial assistance under any health scheme or health insurance plan.	17.038	0.000	H_0 is rejected	0.126 (Moderate)
8		H_0	The adoption of the sale of assets as a financing measure is independent of the occurrence of IP cases in households.	35.248	0.000	H_0 is rejected	0.181 (Strong)
9	A	H_0	Borrowing from family, friends outside the household to finance the healthcare expenses is independent of the occurrence of IP cases in households.	33.997	0.000	H_0 is rejected	0.177 (Strong)
	B	H_0	There is no association between borrowing from family, friends outside the household (without paying interest) to finance the healthcare and the event of IP cases in a household.	111.078	0.000	H_0 is rejected	0.321 (Very Strong)
	C	H_0	There is no association between borrowing from family, friends outside the household (with interest) to finance the healthcare and the event of IP cases in a household.	42.481	0.000	H_0 is rejected	0.198 (Strong)
10		H_0	IP and borrowing from a moneylender to finance the healthcare expenses and the event of IP case(s) in a household are not associated with one another.	17.481	0.000	H_0 is rejected	0.127 (Moderate)

11		H_0	Availing financial assistance from SHGs/MFIs or any other FIs for healthcare expenses and the event of IP case(s) in a household is independent of one another.	33.187	0.000	H_0 is rejected	0.175 (Strong)
12		H_0	The usage of households' savings money to pay for households' health care need is not associated with the event of OP cases in households	8.811	0.003	H_0 is rejected	0.090 (Weak)
13		H_0	The adoption of the sale of assets as a financing measure is independent of the occurrence of OP cases in households.	15.955	0.000	H_0 is rejected	0.122 (Moderate)
14	A	H_0	Households' opting for borrowing from family, friends outside the household to finance the healthcare expenses is independent of the occurrence of OP cases in households.	4.087	0.043	H_0 is rejected	0.062 (Weak)
	B	H_0	There is no association between borrowing from family, friends outside the household (without paying interest) to finance the healthcare and the event of OP visit in a household.	8.295	0.004	H_0 is rejected	0.088 (Weak)
	C	H_0	Borrowing (with interest) from family, friends outside the household to finance the healthcare expenses is independent of the event of OP visit(s).	1.487	0.223	H_0 is not rejected	-
15		H_0	Availing financial assistance from SHGs/MFIs or any other FIs for healthcare expenses and the event of OP visit in a household is independent of one another.	19.152	0.000	H_0 is rejected	0.133 (Moderate)

Source: Compiled by the Author

Table 27 shows that the types of treatment, as well as treatment outcomes, have a somewhat strong influence on the households' decision on selecting from the different financing alternatives for paying the healthcare bills. According to the Chi-Square statistics, associations exist between the death of any family member due to medical condition (during or post-treatment) and three of the available financing alternatives; sale

of assets, borrowing from moneylender(s) and borrowing from relatives/friends (with as well as without interest). Although the strength of the association varies, the association alone indicates that in case of incidence of such cases, the household income and savings are often not enough; hence, households had to draw the needed money from multiple sources. The strength of the association is much more robust with the sale of assets and borrowing from relatives/friends compared to the borrowing from moneylenders. Still, the impact of utilizing any of these alternatives can be devastating as each of these alternatives are highly likely to cause financial strain of different magnitude for different households. On the other hand, the weak association between the presence of chronic conditions in houses and the use of savings and credit from SHG/MFI suggests that the households mostly pay for the healthcare costs for such conditions with the help of their income, occasionally with savings and micro-credits from SHG/MFI. Here, one fact can't be overlooked that in the case of chronic diseases, the households often compromise treatments due to different factors like affordability, the severity of the condition, etcetera; and might be reason for the reported weak associations with the different financing alternatives.

Similar to the occurrence of death cases due to medical conditions, in the case of IP cases as well, the Chi-Square test shows that in light of the high OOP expenses, financing from multiple sources is inevitable. As anticipated, the reliance on friends and relatives is very powerful in the case of IP treatments in general, although the tendency to opt for borrowing from friends/relatives without paying for any interest is more. Most health insurance/health schemes solely focus on IP treatments. The moderate association between IP case incidence and households benefiting from financial assistance from these schemes is an indication that those schemes have been able to provide compensation to households' healthcare expenses to a certain extent. However, to make a proper remark on the role of these schemes as a financing tool for various medical expenses, the adequacy of such financial assistance needs to be assessed further. The strong associations with the credit from SHG/MFI, use of savings, as well as sale of household assets, detected by the Chi-Square tests simply that majority of the households opt for a combination of two or more of these alternatives for paying the medical bills of different IP cases. The presence of a moderate association of IP cases with borrowing from moneylenders confirms that occasionally rural households still have to go for informal channels to borrow money for healthcare. At the current times, the reasons behind doing

so must be explored as the consequences of such borrowings are often proven to be distressing.

OP visits are the most frequent type of treatment for any household, and it has already been established that it is responsible for a considerable share of the households' annual health care expenditure. The Chi-Square test results show that OP visits occurrence has weak to moderate association with the most common financing measures for rural households. In cases of OP visits, the families don't seem to quickly resort to using the savings as we have seen in case of IP cases as well as death caused by medical condition/during or post-treatment. In its place, the financial assistance from SHGs or MFIs in the form of microcredit or the selling off household assets are the most preferred alternatives along with the households' earnings to provide for the healthcare costs. Occasional assistance from friends/relatives is witnessed in the case of OP cases as well.

The annual income sets a limit to the household's affordability to pay for different essential commodities. As the affordability varies from house to house, the necessary goods for the families also change accordingly. Available literature shows that at times due to the impact of high OOP health expenses, instead of an essential commodity, healthcare services are marked as luxury goods. Hence, for this study as well, the influence of households' annual income on households' financing decisions for different types of treatments has been examined. A series of one-way ANOVA tests have been carried out to compare the means of the amount of money drawn from different financing sources, for different types of treatments across various income groups (as mentioned in Table 13). In addition to that, the relevant post hoc tests have been carried out to identify where the difference lies. The statistically significant results are tabulated below (Table 28).[22]

Table 28: One-way ANOVA Test Results (1)

Sl. No	Hypothesis		df	F	Sig.	Result
1	H_0	There is no difference in the average amount of money spent from household income for IP treatment(s) in the past 365 days across the five income groups of the households.	4	9.939	0.000	H_0 is rejected
2	H_0	There is no difference in the average amount of money spent from household savings for IP treatment(s) in the past 365 days across the five income groups of the households.	4	4.878	0.001	H_0 is rejected
3	H_0	There is no difference in the average amount of	4	23.483	0.000	H_0 is

[22] The post-hoc results of the ANOVA tests are available in ANNEXURE C

		money spent from household income for OP treatment(s) in the past 30 days across the five income groups of the households.				rejected
4	H_0	There is no difference in the average amount of money spent from household income in the event of any death of a household member in the past 365 days due to medical conditions (during or post-treatment) across the five income groups of the households.	4	4.180	0.005	H_0 is rejected

Source: Compiled by the Author

The one-way ANOVA test results (Table 28) confirmed statistically significant differences across the different income groups for various financing alternatives available. The following inferences can be drawn from the results from the above table.

- Hypothesis 1: The one-way ANOVA test shows that there is a statistically significant difference in the average amount of money spent from household income for IP treatment(s) in the past 365 days between the different income groups. The post hoc test shows that the amount of money spent from household's income is significantly high for the highest income group (Rs. 231000 or more) when compared with the remaining four income groups. On the other hand, we have also observed a significant difference in the average amount of money spent on IP cases from household income between the lowest income group (up to Rs 60000) and the second-highest income group (from Rs 129601 up to Rs. 231000).

- Hypothesis 2: The ANOVA test results negate the null hypothesis that the average amount of money spent from household savings for IP treatment(s) in the past 365 days is same across the five income groups of the households. The post hoc analysis shows that there is a significant difference in the average utilization of saving money for IP treatments between the highest income group and the bottom two income groups. The average amount of money used from household savings by the highest-income household (more than Rs.231000) is considerably higher than the bottom two income groups (i.e., up to Rs. 60000 and from Rs.60001 to Rs 90000). The intermediate income group (from Rs.90001 to Rs 129600) doesn't show any significant difference in financing amount in comparison with the other four groups.

- Hypothesis 3: The one-way ANOVA proved that there is a significant difference in the average amount of money spent from household income for OP treatments in a month's duration across the five income groups. In the case of OP visits, the average amount of money financed from household income varies vastly between the bottom two income groups and the top two income groups. In the hierarchical order of household

incomes, the high-income household seems to pay a significantly higher amount from household income for OP care compared to low-income houses. The intermediate income group financing extent is found to be insignificant here as well.

- Hypothesis 4: There is a significant difference in the average amount of money spent from household income in the event of any death of a family member because of medical reasons in the previous year across five income groups. Here as well, post hoc test results have shown that the highest income group households pay a larger share of such treatment costs out of their household income in comparison to the houses belonging to the bottom two income groups. But no significant difference has been detected between the other income groups.

The series of one-way ANOVA tests have made one thing clear that irrespective of types of treatment (IP, OP, or death cases), household income level has a significant influence on the financing decisions. The share of household income utilized for different types of treatment is much higher for high-income households compared to low-income categories. Household income is one of the primary sources of a household's savings as well. The savings amount for a low-income house is always less than that of a high-income house, and hence, the limit on utilizing the saved money for healthcare or other essential commodities. ANOVA results have also confirmed that high earning families can afford a higher sum of money from their savings for health care requirements in comparison to families with low-income. Since high-income households can pay for a large share of treatment costs from their annual income money, there is very little room left for utilizing other channels of financing. But for low-income households, as they contribute very less from their household earnings at the time treatment, they often have to rely on the other alternatives available for financing the majority of the treatment cost, which might cause financial strain for the households in the long run.

It has been already established that the public-private disparity is very prominent in the case of healthcare treatment costs, and the study further confirms that different illness treatment patterns have a strong association with households' healthcare cost financing decisions. Now the question is to what extent these healthcare-seeking patterns affect financing choices made by the rural households. Based on the reported cases of treatment, we can categorize the households' healthcare utilization pattern for IP, OP, and death events into three categories: (a) houses that have availed treatment in the public facility only, (b) households consulted only private facilities for treatment and (c) the

households that have visited both public and private facilities for treatment. Here one thing must be noted that this categorization doesn't take into account the reason(s) for provider selection for treatment. To verify our assumptions regarding household's overall treatment seeking-pattern and money sourced from different financing alternatives, another set of one-way ANOVA tests have been carried out. With the help of relevant post hoc tests, the intergroup differences for the significant results of ANOVA tests are also highlighted. The vital test results are summarized in Table 29.

Table 29: One-way ANOVA Test Results (2)

Sl. No	Hypothesis		df	F	Sig.	Result
1	H_0	There is no difference in the average amount of money spent from household income for IP treatment(s) in the past 365 days for the three types of healthcare-seeking behavior based on provider selection (public, private and mixed).	2	12.794	0.000	H_0 is rejected
2	H_0	There is no difference in the average amount of money borrowed from relatives, friends (with interest) for IP treatment costs across the three types of healthcare provider selection patterns.	2	11.093	0.000	H_0 is rejected
3	H_0	There is no difference in the average amount of money borrowed from moneylenders for financing the IP treatment costs across the three types of healthcare provider selection patterns.	2	17.343	0.000	H_0 is rejected
4	H_0	There is no difference in the average amount of financing for IP cost using the household savings in the past 365 days for the three types of healthcare-seeking categories based on provider selection.	2	21.366	0.000	H_0 is rejected
5	H_0	There is no difference in the average amount of money financed through selling off assets for the IP treatment costs for all three categories of healthcare-seeking categories based on provider selection.	2	3.373	0.035	H_0 is rejected
6	H_0	For IP treatment costs, there is no difference in the average amount of financial assistance received from relatives as well as friends (borrowing without interest) for all the three types of healthcare-seeking behavior based on healthcare provider selection.	2	11.338	0.000	H_0 is rejected
7	H_0	There is no difference in the average amount of money borrowed from the SHGs/MFIs to pay for IP cost of treatment for the households for the three types of healthcare-seeking behavior based on provider selection	2	16.846	0.000	H_0 is rejected
8	H_0	There is no difference in the average amount of money spent on OP cases from the household's total income for all three types of healthcare-seeking categories based on provider selection.	2	15.367	0.000	H_0 is rejected
9	H_0	There is no difference in the average amount of financing for OP care costs using household	2	11.643	0.000	H_0 is rejected

		savings across the three types of healthcare-seeking categories based on provider selection.				
10	H_0	There is no difference in the average amount of financing for the OP cases using financial assistance from family/friends (with interest) across the three categories of healthcare-seeking behavior based on provider selection.	2	3.716	0.025	H_0 is rejected

Source: Compiled by the Author

According to the one-way ANOVA statistics (Table 29), across the three types of healthcare provider selection patterns for IP treatments, the significant difference in means is detected for three financing measures: annual household income, borrowing from relatives/friends with interest and borrowing from moneylenders (from hypotheses 1, 2, and 3). There is a notable variation witnessed in the average amount of financing for IP cost using the household savings in a year across the three healthcare-seeking categories based on provider selection pattern (hypothesis 4: $F = 21.366$, $p = 0.000$). The post hoc test for hypothesis 4 shows that the households that have availed IP treatment solely in private facilities in the past year have to pay much more in comparison to the houses availing such treatment either in public facilities or in both public and private facilities. The use of household assets to arrange money for IP treatment costs also varies significantly across the different healthcare-seeking patterns based on the type of provider chosen (hypothesis 5). To be more specific, for IP cases amount of money financed through the sale of asset(s) is significantly higher (by Rs. 15480.48) for families opting for treatment in both type facilities compared to households whose treatment is limited to government facilities only. The extent of financial assistance received from relatives/friends (without any interest) seems to vary widely across three categories of healthcare provider selection by the households (hypothesis 6). It is already clear that in the rural settings of Assam, SHGs/MFIs are the most utilized source of finance for healthcare requirements, but the borrowing pattern from these SHGs/MFIs to finance the IP cost varies across the households according to the provider selection for treatment (hypothesis 7). Apparently, according to the post hoc test results, the amount of micro-credit utilized for IP treatment cases is significantly higher for the households that have availed the IP treatments in private facilities solely than the houses that have gone for government providers only.

On the other hand, one-way ANOVA for the financing decisions concerning the OP treatment expenses also revealed notable differences across the three categories of

healthcare provider selection. The amount of money spent out of household income for OP treatments seemed to vary significantly for three types of healthcare facility usage patterns (hypothesis 8). According to the follow-up post hoc test, when houses consulted with either private facilities or both public and private facilities, they have to spend a higher amount of money from household income than households solely relying on public healthcare providers for OP treatments. Similarly, the usage of household savings for OP treatment also differs for the different healthcare-seeking decisions (hypothesis 9). A significant intergroup difference exists in the average amount of household savings utilized for OP cases between houses that have visited the public facilities only and the households visiting private facilities solely. In the case of the OP visits as well, similar to the IP cases, a significant difference in average borrowing from friends/relatives prevails across the three healthcare provider selection groupings (hypothesis 10).

The repercussions of the high cost of treatment in private healthcare facilities seem to be very intense amidst rural households. The above one-way ANOVA tests are sufficient to affirm that the utilization of different financing alternatives to cater to the different treatment costs is highest if the families' have availed treatment from any private healthcare provider(s). The average amount of money drawn from different financing channels is higher if the treatment process involves either private healthcare providers only or both public as well as private healthcare providers in case of multiple visits. Either way, private healthcare providers are responsible for drawing out a large amount of money from different alternatives available. Since such financing is not from any health scheme or health insurance plan, the impact of these financing can be devastating for the households.

The majority of the families prefer to pay for the various healthcare services from their regular earnings, but often the household income is not enough to pay the medical bills. The annual income often sets a limit to a household's affordability to pay for healthcare treatments. The One-way ANOVA tests have confirmed that the amount spent from family income varies across the income categories for IP, and also in the event of family member's death from ailments. Post hoc test results confirm that the highest income household always spent most out of their income compared to others. When household income isn't sufficient, families adopt other alternatives. The Chi-Square and One-way ANOVA tests have established that several variables representing the demographics and treatment patterns of the households share a close association with

these financing decisions. To further quantify the influence of different determinants on the financing decisions of the families, several binary logistic regressions have been carried out using the variables identified by Chi-Square and ANOVA tests. The results for each of the six financing alternatives are summarized below.[23]

a) Household Savings

According to the Chi-square test, the utilization of household savings for healthcare purposes has an association with five variables. There is a strong association between usage of savings and the geographic position of the households, i.e., district of the family, and the incidence of IP cases as well. The social group of the family and the use of household savings shares a moderate association in the rural setting. We have observed a weak association with the presence of chronic diseases in the house and the occurrence of OP cases. On the other hand, the One-way ANOVA test established that there is significant variation in the utilization of savings money across the five income groups of the household. So, considering all these six categorical variables, we have run a binary logistic regression (BLR). The Hosmer and Lemeshow test results confirmed that the derived logit model is a good fit for the data.

Table 30: Logit Model (1) on using Household Savings

Variable			B	S.E.	Wald	df	Sig.	Exp(B)
Sl. No	Name	Description						
1	chronic(1)	Presence of chronic ailments in the HH	.464	.227	4.173	1	.041	1.590
2	IP(1)	Incidence of IP cases in the HH	1.157	.229	25.450	1	.000	3.180
3	OP(1)	Incidence of OP visits in the HH	.431	.207	4.309	1	.038	1.538
4	Inc_A_Grp	Income group of the households (Ref. Cat.: Rs 231001 or more p.a.)			10.751	4	.030	
	Inc_A_Grp(1)	Rs 60000 or less p.a.	-.199	.291	.465	1	.496	.820
	Inc_A_Grp(2)	Rs 60001-Rs 90000 p.a	.074	.317	.054	1	.816	1.077
	Inc_A_Grp(3)	Rs 90001-Rs 129600 p.a.	.886	.361	6.027	1	.014	2.426
	Inc_A_Grp(4)	Rs 129601-Rs 231000 p.a.	.298	.317	.884	1	.347	1.348
5	District	Residing district of			31.778	2	.000	

[23] The primary assumptions for each of the BLRs have been tested thoroughly before carrying out the regressions, and the results are available in Annexure D

		the HH (Ref. Cat: Darrang)						
	district(1)	Nalbari	-.906	.297	9.309	1	.002	.404
	district(2)	Morigaon	-1.484	.263	31.758	1	.000	.227
6	Caste	The social group of the HH (Ref. Cat.: General)			3.333	3	.343	
	caste(1)	OBC	.129	.268	.231	1	.631	1.137
	caste(2)	SC	.949	.642	2.180	1	.140	2.582
	caste(3)	ST	-.256	.303	.710	1	.399	.775

Source: Compiled by the Author

Out of the six variables, five variables are statistically significant for a 95 percent confidence interval. The BLR estimates suggest that in the presence of chronic ailments, households are more likely (1.590 times) to use saving money for treatment than houses without any chronic disease. Similarly, when a family has to avail of IP treatment, they are highly likely to spend the household savings (3.180 times). In the case of OP visits as well, the likelihood of using saving money is high but not as high as IP cases (1.538 times). According to the odds ratios, there is a significant difference in using household savings between middle-income households (Rs 90001-Rs 129600) and the highest-income households (Rs 231001 or more in a year). Families with moderate earnings are highly likely (2.426 times) to utilize the saving to pay the medical bills. The extent of financing healthcare using household savings widely varies across the state, from district to district. The odds ratios revealed that, in comparison to the households from Darrang district, the houses from Nalbari district are 0.404 times less likely to their savings. On the other hand, families residing in Morigaon district are 0.227 times less likely to pay their medical bills out of household savings. Although the social group shared a moderate association with the household's decision to spend savings money for healthcare, it is not a contributory determinant in the matter.

b) Health Insurance

Health insurance penetration is quite low in Assam and also among the sample households. The number of families benefitted from health insurance plans is also pretty less. These health insurance schemes provide financial protection against the cost of specific IP treatments only. The Chi-square test detected a moderate association between health insurance reimbursement and the presence of IP cases in households. There is a weak association with the household's geographic location as well. But the binary logit model (Table 31) shows that the geographic location of the houses is not significant in

receiving compensations from health insurance schemes. But among the few households with health insurance enrolment, the families that have to avail IP treatments are highly likely (7.934 times) to benefit from such schemes

Table 31: Logit Model (2) for Health Insurance

Variable			B	S.E.	Wald	df	Sig.	Exp(B)
Sl. No	Name	Description						
1	IP(1)	Incidence of IP cases in the HH	2.071	.623	11.041	1	.001	7.934
2	district	Residing district of the HH (Ref. Cat: Darrang)			4.158	2	.125	
	district(1)	Nalbari	-1.695	1.050	2.609	1	.106	.184
	district(2)	Morigaon	.387	.437	.785	1	.376	1.472

Source: Compiled by the Author

c) Sale of assets

It has been found that the decisions of selling off assets for healthcare needs are strongly associated with the event of the death of any member from the house due to medical reasons and IP of treatment from the previous year. However, the geographic location of the household (district), the social group of the household members, income level of the family, and the incident of OP visits also share an association of moderate strength. These six variables are tested through two BLR models to check to what extent they are influential in forcing households to sell off any of their assets during medical emergencies.

Table 32: Logit Model (3) on Sale of Assets

BLR No	Variable			B	S.E.	Wald	df	Sig.	Exp(B)
	Sl. No	Name	Description						
BLR 1	1	IP(1)	Incidence of IP cases in the HH	.917	.150	37.229	1	.000	2.502
	2	OP(1)	Incidence of OP visits in the HH	.763	.172	19.573	1	.000	2.144
	3	death(1)	Death of a HH member due to medical reasons	1.398	.273	26.280	1	.000	4.046
BLR 2	4	District	Residing district of the HH (Ref. Cat: Darrang)			15.250	2	.000	
		district(1)	Nalbari	-.855	.237	13.028	1	.000	.425

		district(2)	Morigaon	.088	.177	.249	1	.618	1.093
	5	Caste	The social group of the HH (Ref. Cat.: General)			10.575	3	.014	
		caste(1)	OBC	.336	.172	3.806	1	.051	1.399
		caste(2)	SC	.919	.386	5.651	1	.017	2.506
		caste(3)	ST	.438	.254	2.970	1	.085	1.549
	6	Inc_A_Grp	Income group of the households (Ref. Cat.: Rs 231001 or more p.a.)			19.993	4	.001	
		Inc_A_Grp(1)	Rs 60000 or less p.a.	1.079	.243	19.763	1	.000	2.941
		Inc_A_Grp(2)	Rs 60001-Rs 90000 p.a	.638	.254	6.317	1	.012	1.893
		Inc_A_Grp(3)	Rs 90001-Rs 129600 p.a.	.614	.255	5.789	1	.016	1.849
		Inc_A_Grp(4)	Rs 129601-Rs 231000 p.a.	.610	.254	5.753	1	.016	1.840

Source: Compiled by the Author

All six variables considered for the two logit models (Table 32) are found to be statistically significant in the final decision of asset selling. According to the odds ratios, a household is most likely to sell off household assets if any family member dies during or post-treatment (OR = 4.046). Households with IP cases (OR = 2.502) and OP visits (OR = 2.144) also opt for asset sales to clear the bills, but the chances are relatively less compared to death cases. The results further established that preference level for selling of assets is not the same across the state. The families from the Nalbari district are less likely (0.425 times) to sell assets for healthcare, compared to households from the Darrang district. But the influence is non-significant for the families from Morigaon district. The social group of the house also affects the household's decision of asset selling. In comparison to the general (forward) category families, OBC and SC are more likely to sell off their household assets to finance healthcare treatments. The probability of asset selling for SC households is almost twice (OR = 2.506) the probability of that for OBC households (OR = 1.399). Besides, families from the bottom income group are also most inclined to asset selling compared to the highest-income families (OR = 2.941). Similarly, the houses from the other three income levels are also prone to selling their assets, but there is not much difference in the possibilities.

d) Financial assistance from relatives and friends

The Chi-square test results imply that four variables share specific associations with accepting financial help from relatives and friends. We've also noted a strong association of taking such financial aids with the presence of IP cases in a house and a moderate association with the households' family size. Moreover, OP visits by the families and their income groups share a weak association with such finances. The BLR model derived using these four variables showed that although the family size is significant in deciding on the matter, no intergroup difference is statistically significant.

Table 33: Logit Model (4) on financial assistance from relatives and friends

Variable			B	S.E.	Wald	df	Sig.	Exp(B)
Sl. No	Name	Description						
1	IP(1)	Incidence of IP cases in the HH	.760	.131	33.872	1	.000	2.138
2	OP(1)	Incidence of OP visits in the HH	.340	.139	5.969	1	.015	1.405
3	Inc_A_Grp	Income group of the households (Ref. Cat.: Rs 231001 or more p.a.)			10.818	4	.029	
	Inc_A_Grp(1)	Rs 60000 or less p.a.	.669	.219	9.283	1	.002	1.952
	Inc_A_Grp(2)	Rs 60001-Rs 90000 p.a	.459	.219	4.404	1	.036	1.582
	Inc_A_Grp(3)	Rs 90001-Rs 129600 p.a.	.199	.219	.825	1	.364	1.220
	Inc_A_Grp(4)	Rs 129601-Rs 231000 p.a.	.321	.208	2.393	1	.122	1.379
4	HH_size_grp	HH family size (Ref. Cat: 7 or more members)			13.232	4	.010	
	HH_size_grp(1)	Single/ 1 member	.034	.586	.003	1	.954	1.034
	HH_size_grp(2)	2 members	.577	.354	2.662	1	.103	1.781
	HH_size_grp(3)	3-4 members	-.384	.200	3.699	1	.054	.681
	HH_size_grp(4)	5-6 members	-.366	.201	3.327	1	.068	.694

Source: Compiled by the Author

The presence of IP cases increases the chances of accepting financial help from relatives and friends by 2.138 times. Similarly, in the event of OP visits for the families, the probability of households taking monetary help raises 1.405 times. In terms of annual income categories, odds ratios confirm that the households from the bottom two income group are more likely to accept money from friends and relatives for medical emergencies (Odds Ratios = 1.952, 1.582), compared to the highest earners.

When we explored the association of financial aid from relatives and friends in the form of credits, we detected strong associations with the residing district of the households, and in the event of IP cases as well as death cases. The association with OP visits is weak in this scenario too. According to the odds ratios for the logit model (5) with these four variables, a household is most likely to borrow money in credit from relatives and friends in the event of IP cases (OR = 4.875), followed by death incidents (OR = 4.014) and OP visits (OR = 1.674). In the case of the residing districts of the households, the families from Nalbari districts are less likely (OR =0.234) to avail credits from relatives and friends compared to Darang district households. The families from Morigaon district don't have any significant association with such borrowings.

Table 34: Logit Model (5) for borrowing with interest

Variable			B	S.E.	Wald	df	Sig.	Exp(B)
Sl. No	Name	Description						
1	IP(1)	Incidence of IP cases in the HH	1.584	.269	34.681	1	.000	4.875
2	OP(1)	Incidence of OP visits in the HH	.515	.264	3.812	1	.051	1.674
3	death(1)	Death of a HH member due to medical reasons	1.390	.340	16.707	1	.000	4.014
4	District	Residing district of the HH (Ref. Cat: Darrang)			15.361	2	.000	
	district(1)	Nalbari	-1.451	.485	8.962	1	.003	.234
	district(2)	Morigaon	.433	.245	3.114	1	.078	1.542

Source: Compiled by the Author

Table 35: Logit Model (6) for borrowing without interest

Variable			B	S.E.	Wald	df	Sig.	Exp(B)
Sl. No	Name	Description						
1	IP(1)	Incidence of IP cases in the HH	1.668	.271	37.76	1	.00	5.300
2	death(1)	Death of a HH member due to medical reasons	1.686	.348	23.47	1	.00	5.397
3	HH_size_grp	HH family size (Ref. Cat: 7 or more members)			.225	4	.99	

	HH_size_grp(1)	Single/ 1 member	-18.467	10349.017	.000	1	.99	.000
	HH_size_grp(2)	2 members	-.137	.580	.056	1	.81	.872
	HH_size_grp(3)	3-4 members	-.004	.357	.000	1	.99	.996
	HH_size_grp(4)	5-6 members	.086	.359	.058	1	.81	1.090
4	Inc_A_Grp	Income group of the households (Ref. Cat.: Rs 231001 or more p.a.)			6.878	4	.14	
	Inc_A_Grp(1)	Rs 60000 or less p.a.	.979	.430	5.192	1	.02	2.662
	Inc_A_Grp(2)	Rs 60001-Rs 90000 p.a	1.012	.415	5.941	1	.02	2.752
	Inc_A_Grp(3)	Rs 90001-Rs 129600 p.a.	.638	.430	2.196	1	.14	1.892
	Inc_A_Grp(4)	Rs 129601-Rs 231000 p.a.	.677	.407	2.768	1	.1	1.968

Source: Compiled by the Author

According to the frequency table (Table 22), rural households mostly prefer borrowing without interest options for healthcare needs. The Chi-square test suggests that these borrowings also have a strong association with both IP and death cases. Here, we detected weak associations with family size and income level instead of OP visits. But they are not significant determinants of households' decision to borrow money from relatives and friends, according to the BLR model 6 (Table 35). Houses with IP and death cases are more likely to opt for these borrowings. The odds ratios for both IP and death cases are also similar; it means the probabilities of households accepting money from friends/relatives are almost the same for both the events.

e) Loan from moneylenders

Rural households rarely opt for borrowing money from informal channels, i.e., moneylenders for healthcare needs, but people still relying on this channel is alarming at current times. The moderate association with IP episodes implies occasional credits from moneylenders for IP bill. The nominal association with the household's income level signifies the significant influence of the financial condition of the families. On the other hand, the death of family members because of medical reasons and the social group of the family also shares a weak connection.

According to the BLR model, these four variables are significant for the households' decision on whether to go to moneylenders for financing the healthcare

needs. The occurrence of IP cases (OR = 2.369) and the event of family member's death due to medical reasons (OR = 1.991) make families more likely to borrow from moneylenders. The preference level for borrowing money from moneylenders varies across the four social groups of society. Compared to the ST group households, general or forward class households are least likely to borrow money from moneylenders (OR = 0.557), followed by the houses from OBC (OR = 0.410) and SC categories (OR =0.330). Again, the odds ratios have clarified that the bottom two income groups are highly prone to adopting the informal channels of financing (OR = 2.705 and 2.033).

Table 36: Logit Model (7) on loans from moneylenders

Variable			B	S.E.	Wald	df	Sig.	Exp(B)
Sl. No	Name	Description						
1	IP(1)	Incidence of IP cases in the HH	.863	.188	20.948	1	.000	2.369
2	death(1)	Death of a HH member due to medical reasons	.689	.331	4.338	1	.037	1.991
3	Caste	The social group of the HH (Ref. Cat.: ST)			9.080	3	.028	
	caste(1)	General	-.584	.275	4.513	1	.034	.557
	caste(2)	OBC	-.891	.319	7.809	1	.005	.410
	caste(3)	SC	-1.109	.541	4.195	1	.041	.330
4	Inc_A_Grp	Income group of the households (Ref. Cat.: Rs 231001 or more p.a.)			24.563	4	.000	
	Inc_A_Grp(1)	Rs 60000 or less p.a.	.995	.287	12.006	1	.001	2.705
	Inc_A_Grp(2)	Rs 60001-Rs 90000 p.a	.709	.296	5.751	1	.016	2.033
	Inc_A_Grp(3)	Rs 90001-Rs 129600 p.a.	-.226	.349	.419	1	.518	.798
	Inc_A_Grp(4)	Rs 129601-Rs 231000 p.a.	.107	.318	.112	1	.737	1.113

Source: Compiled by the Author

f) Micro-Credit from SHG/MFIs or FIs

Microcredit from SHG/MFIs is very common in rural Assam for different purposes, including healthcare needs. The strong association with the geographic location of the households infers that its acceptance level varies from one district to another. Apart from that, the incidence of IP cases in a family also has strong associations with the

availing credit from SHG/MFI. In contrast to it, we have witnessed weak associations with the religion of the families and the presence of chronic diseases in households. The Chi-square test confirmed that there are moderate associations with the OP visits by the families, the social group of the families, and the income level of the households.

The BLR model derived using these variables confirmed that out of the seven variables, only six variables are statistically significant in determining when a household avails microcredit from SHG/MFIs for financing the healthcare need. The chances of taking micro-credits from SHG/MFI is the highest in the event of IP treatment (OR = 2.474), followed by the OP events (OR = 1.848) and the prevalence of chronic ailments in the houses (OR = 1.443). Among the three districts, households from Nalbari are 2.018 times more likely to take micro-credits, and families from Morigaon are 0.538 times less likely, compared to the families of the Darrang district. There is a variation across the social groups in this case as well. Compared to the ST category, households from general/forward category (OR= 0.482) are less likely to avail of these micro-credits, while the remaining two groups remained statistically non-significant. The different income group households have a different level of influence over the decision on availing micro-credits. The overall association is positive, and although odds ratios fluctuate across the groups, compared to the highest-earning families, all the rest of the households are highly dependent on these micro-credits for healthcare. The household religion remained non-significant on the subject.

Table 37: Logit Model (8) on microcredit from SHG/MFI or FIs

Variable			B	S.E.	Wald	Df	Sig.	Exp(B)
Sl. No	Name	Description						
1	IP(1)	Incidence of IP cases in the HH	.906	.138	43.252	1	.000	2.474
2	OP(1)	Incidence of OP visits in the HH	.614	.148	17.175	1	.000	1.848
3	chronic(1)	Presence of chronic ailments in the HH	.367	.164	4.991	1	.025	1.443
4	District	Residing district of the HH (Ref. Cat: Darrang)			36.192	2	.000	
	district(1)	Nalbari	.702	.189	13.809	1	.000	2.018
	district(2)	Morigaon	-.621	.176	12.404	1	.000	.538
5	religion(1)	Hindu families	.002	.194	.000	1	.990	1.002
6	Caste	The social group of the HH (Ref. Cat.: ST)			15.417	3	.001	

	caste(1)	General	-.730	.294	6.158	1	.013	.482
	caste(2)	OBC	-.288	.268	1.153	1	.283	.750
	caste(3)	SC	.515	.458	1.261	1	.261	1.673
7	Inc_A_Grp	Income group of the households (Ref. Cat.: Rs 231001 or more p.a.)			23.482	4	.000	
	Inc_A_Grp(1)	Rs 60000 or less p.a.	.646	.218	8.809	1	.003	1.909
	Inc_A_Grp(2)	Rs 60001-Rs 90000 p.a.	.956	.221	18.681	1	.000	2.602
	Inc_A_Grp(3)	Rs 90001-Rs 129600 p.a.	.691	.219	9.923	1	.002	1.996
	Inc_A_Grp(4)	Rs 129601-Rs 231000 p.a.	.907	.218	17.239	1	.000	2.476

Source: Compiled by the Author

4.4. Summary:

The findings of this chapter claim that the financial burden of OOP health expenses is significantly high for the rural households. Post segregation of total household healthcare expenditure into different sub-components, it has been found that the average direct cost of treatment is much higher than indirect healthcare costs. Such high cost of treatment is a matter of great concern as high OOP health expenses have been often held responsible for households' compromising in healthcare treatment or resorting to traditional methods of treatments. The consequences of such decisions will get reflected in the overall health conditions of the population as the health status is subject to deteriorate in the long run without formal healthcare. The study data also confirmed the presence of high public-private disparity in the direct cost of treatment for the study area, in line with the similar findings from the available literatures from different parts of India (Mohanty, et. al, 2019; Singh, 2019; Garg, et. al, 2021; Garg, et. al, 2022). According to the estimations, the cost of treatment in private facilities exceeds the treatment cost in public facilities by many folds in almost all cases. Despite such high cost of treatment, the considerable number of households' reliance on private healthcare facilities irrespective of their financial background raises questions regarding the efficacy of the current public healthcare delivery system.

To address the issue of high OOP health expenses among the rural households adequately, one must first find out what are the factors that have a strong influence over the extent of a household's annual healthcare expenses. The study tried to identify a group of factors from three categories: demographics, disease/treatment patterns, as well

as different healthcare cost components that have significant influence over households' OOP health expenses. As per the discussion from the Section 2.2.1, it was found that both demographic profiles and healthcare pattern have significant influence on the extent of OOP health expenses incurred by any household. However, the analysis from the current study reported that the different disease/treatment patterns and healthcare cost components have a stronger influence over the OOP expenses than the household's demographic settings. Besides the study also provided a clear segregation of the various cost components of OOP healthcare expenses and their impact on the households' overall OOP spendings. The set of factors demonstrating a strong influence on the OOP health expenses comprises of OP cost of treatment, OP cost of treatment in private facilities and cost of medications associated with those OP visits (irrespective of the type of provider visited). The odds of incidence of OP visits likely to be higher for any household, compared to IP cases or treatment cases leading to the death of the household member. Hence, the OP cost is more likely to contribute a significant amount to the household's total health expenditure in a year for the majority of the families. Since the private care costs higher, OP treatment cost in private facilities is likely to contribute more to a household's OOP expenses. The cost of medicines being considerably high, its impact on the household's OOP expenses expected to be pretty extensive (Ambade, et. al, 2022), and the study upholds this assumption as well. On the other hand, the number of visits to providers for IP, as well as OP cases are the moderate determinants of household OOP expenses. The influence of IP treatment cost on OOP expenses is moderately positive, relatively lower than OP costs, but still significant. It is clear from the study that the disparity among public-private providers also sets the range of OOP health expenses for households. The impressions of the costs of treatment in any private facilities are relatively much stronger on OOP expenses than that in public facilities.

According to government reports, the burden of OOP health expenses for Indians is very high (National Health Systems Resource Centre, 2019), and from the study, it has been observed that due to the high costs the rural households have to struggle to accommodate their necessary health care treatments since the households' earning are often not enough for it. The study revealed that as a result of high costs, the rural households had to adopt from the other financing alternatives available, in line with findings reported by Sangar, Dutt & Thakur (2018), Dhanaraj (2016) and Quintussi, et. al. (2015). In addition to the existing literature, the study further provided detailed insights

into the financing patterns and its determinants. The study shows that for the instances where household earnings are not enough to pay the healthcare bills, households mostly rely on micro-credits from SHGs/MFIs and borrowing from relatives/friends. Although several health schemes/health insurance policies are out there, to financially assist in health care service deliveries, the study recorded only few cases of utilization of such schemes. Health insurance schemes are considered the most efficient tools for financing healthcare costs (Kusi, Hansen, Asante, & Enemark, 2015; Mekonen, Gebregziabher, & Teferra, 2018; Navarrete, 2018; Zhao, et al., 2019), but the study could not provide any evidence of optimal utilization of this alternative in the rural settings. The limited coverage of different ongoing health schemes, in terms of population and healthcare services, might be the reason for such low utilization. As a result, most of the households get compelled to settle for other alternatives irrespective of their adequacy.

The financing strategies adopted by rural families to pay for the different healthcare treatments varied widely across the districts. Household demographics often play a significant role in any household related financial decision, including household healthcare financing decisions as well. Assam is a vast state with diverse cultures, and each of these cultures has its own belief. These beliefs and views seem to have the potential to persuade households' healthcare financing decisions to an extent. The study suggests that backward class (OBC, SC) households mostly prepared to use their assets at the time of emergency, but they refrained from informal channels. On the other hand, the forward category households mostly deny using credit from informal channels and formal channels as well. The income level of the houses defines the limit of affordability for every family, but it is a strong determinant of financing decisions as well. For moderate and high-income households, saved money and household incomes are often enough to pay for healthcare costs. But the bottom income groups often rely on unsafe financing alternatives like sale of assets, borrowings, and credits from informal channels. Due to this high dependence on these riskier financing alternatives, financially weak grow more vulnerable to high healthcare costs. The study findings suggest that apart from borrowing from friend and relatives, rural households from all income groups are almost equally inclined towards the micro-credits from SHG/MFIs, and these micro-credits are not always exclusive to healthcare needs only. Thus, the chances of multiple borrowing are high, and it might lead to over-indebtedness as well.

The treatment type and outcomes also affect a household's financing pattern. From diseases and treatment patterns point of view, cost varies extensively for different types of treatments. For the excessively high costs of treatment (witnessed in IP cases or ailments leading to the death of the patient), the adoption of extreme measures like sale of household sets or loans from different formal and informal channels is apparent. For relatively cheaper treatment costs (mostly in case of OP treatments or prescribed treatments for pre-existing medical conditions), households mostly resort to financial help from relatives/friends or micro-credits from SHGs.

In short, it seems most of the households eventually end up with borrowed money from different sources, irrespective of treatment type. But the amount of such borrowings is higher for critical cases like IP treatment or death because of severe ailments, compared to seasonal illnesses (OP visits). Thus, one could say that the healthcare requirements and the household demographics together have a strong significant influence over the household's ultimate decision on how to pay for the medical bills. Affordability is still an issue for most of the rural households. Because of the high cost of treatment, most of the families often draw a sizeable portion of annual healthcare expenses from multiple sources, and the contribution from households' earnings (annual income and savings) is relatively less. The extent of borrowing is the highest for low-income families, proving that the weaker section of the society is still vulnerable to such financial shocks. India has always been following a pro-poor financing strategy for healthcare delivery, yet the poor households are struggling to pay for their treatment. It raises questions regarding the efficacy of the existing healthcare system of the country.

Since households' earnings are often not enough to match such high treatment costs, the use of other financing tools (other than health insurance schemes) is inevitable in the rural setting. Each of these alternatives has prolonged financial consequences as the sale of assets results in depletion in wealth, and households have to finally repay all kinds of borrowings out of their own pockets, in case of repayment with interest further increases the burden for the families. Especially the lower-income households have to make adjustments on several levels. Among the several borrowing sources, the rural households from all income groups are highly dependent on micro-credits from SHGs/MFIs for healthcare needs alongside other household necessities. Such frequent and repeated borrowing from SHGs/MFIs increases the chances of over-indebtedness many folds, making the households financially more vulnerable.

Thus, the chapter findings indicates that high financial burden due to healthcare prevails in this part of the country as well, and the high cost of healthcare services in the private sector facilities is one of the prime reasons for that. Apart from that, it has also reported that the households' earnings are often not enough to match such high treatment costs, leading to the use of other financing tools excluding the financial assistance under any health scheme or health insurance policy. In the absence of financial protection from health schemes, now the primary concern is the consequences of adopting those financing alternatives. Hence, the impact of both high OOP health care costs, as well as the financing measures approved by the households to meet the requirements, should be investigated next for the complete evaluation of the healthcare financing scenario at the household level.

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