Chapter 8

Multivariate analysis on utilisation of care

8.1. Introduction

Utilisation of services may be considered as an event. In that case it will be binary in nature. We may assign it 1 if the event has occurred, 0 otherwise. Utilisation of care may have many dimensions. After going through data, we have found suitable to form two broad groups: utilisation of a care from modern source in consultation with doctors and medical specialists in one group, and utilisation from traditional source (including treatment from paramedical or supporting stuff and from any system of medicine except allopathy and Homeopathy) or self-treatment or family-treatment, etc. in the other. From the above review of literature we found the following predictor variables relevant which may affect health services utilisation in North Bengal: age, gender, and caste of the morbid person, family size (size of a household), education of the head of the household, normal out-of-door trips by the head of the household, household cash income, type of illness, severity of illness, type of health facility, system of medicine, quality of care, and total direct costs or price of a care. However, as household cash income may not always be related to ability to pay health care, we plan to include some proxy measures of households' agricultural possessions and standard of living. In addition to this, as this particular region is far away from the important Indian cities, and as people of this region are compelled to travel a lot, we can examine whether this traveling habit has any bearing on utilisation of services. Finally, studies based on small sample survey could not explore the relationship between availability of health facilities and utilisation of care mainly because of common sources of care for many people. But one can consider place of residence as a proxy measure of availability (Elo 1992) with the assumption that health facilities are not easily available in the rural areas, but are available in urban areas. Definitions of the response and predictor variables are shown in table 18. Simple

statistical comparison provides us with certain clues but is not sufficient to draw substantive conclusions. In order to get precise relationships and estimates the study resorts to multivariate analysis. In this chapter we have done binary logit regression analyses and multiple classification analyses to analyse pattern of utilisation of care.

8.2. Results of binary logit models on utilisation of care

Table 57: Log odds (β) of utilisation of health care from modern source

Independent variables	Rural	Urban	Combined
Characteristics of the subject			
Age group (rc: 0-4, under 5 age group)			
Young age group (5-14)	- 0. 790	-0.146	-0.420
Older age group (15 +)	1.430***	0.511	0.954**
Gender (rc: Male)			
Female	- 0.308	-0.467	-0.290
Caste (rc: Scheduled Caste & Tribe)			
General	0.795*	0.281	0.460*
Family size (rc: small)			
Large	- 1.071***	-0.317	-0.751
Education of the HH (rc: illiterate & primary)			
Secondary & higher	- 0.024	0.676	0.305
Normal out-of-door trips (rc: less)			
More	1.911***	0.389	1.029***
Travel to distant place (rc: no travel)			
Travel (Yes)	0.271	0.241	0.341
Standard of living index (rc: low)			
High	0.482	-0.431	0.217
Agricultural possessions (rc: low)			
High	- 0.182	-0.868**	-0.396
Cash income (rc: low)			
Medium	0.038	0.161	-0.153
High	- 0.659	1.192	0.181*

Continued on page 131

Continued on page 130

Characteristics of the disorder			
Type of illness (rc: Group I)			
Group II	- 0.464	-0.194	-0.289
Group III	- 0.306	-0.354	-0.327
Severity of illness (rc: low)			
Medium	0.160	0.065	0.336
High	1.458***	-0.037	0.932***
Characteristics of the service			
Availability (rc: no)			
Yes	-	-	-0.803**
System of medicine (rc: traditional & other)			
Allopathy	0.739	0.502	0.786**
Homeopathy	2.325***	0.164	1.449***
Type of facility (rc: private & other)			
Public	3.673***	-0.270	2.024***
Quality of care (rc: low)			
High	- 0.298	0.424	0.186
Cost per episode (rc: low)			
Medium	0.747	1.461***	0.975***
High	1.747***	1.216***	1.208***

*rc: reference category, HH: Head of the household ***p<0.01, **p<0.05, *p<0.1*

Table 58. Odds ratios [Exp (β)] of utilisation of health care from modern source

Predictor variables	Rural	Urban	Combined
Characteristics of the subject			
Age group (rc: 0-4, under 5 age group)			
Young age group (5-14)	0.454	0.864	0.657
Older age group (15 +)	4.177***	1.667	2.597***
Gender (rc: Male)			
Female	0.735	0.627	0.748
Caste (rc: Scheduled Caste & Tribe)			
General	2.215*	1.325	1.584*
Family size (rc: small)			
Large	0.343***	0.728	0.472

Continued on page 132

Continued from page 131

Education of HH (rc: illiterate & primary)			
Secondary & higher	0.976	1.966	1.357
Normal out-of-door trips (rc: less)			
More	6.760***	1.475	2.799***
Travel to distant place (rc: no travel)			
Travel (Yes)	1.312	1.272	1.407
Standard of living index (rc: low)			
High	1.619	0.650	1.242
Agricultural possessions (rc: low)			
High	0.834	0.420**	0.673
Cash income (rc: low)			
Medium	1.039	1.175	0.858
High	0.518	3.293	1.198*
Characteristics of the disorder			
Type of illness (rc: Group I)			
Group II	0.629	0.824	0.749
Group III	0.737	0.702	0.721
Severity of illness (rc: low)			
Medium	1.173	1.067	1.399
High	4.298***	.964	2.539***
Characteristics of the service			
Availability (rc: no)			
Yes	-	-	0.448**
System of medicine (rc: traditional & other)			
Allopathy	2.094	1.652	2.195**
Homeopathy	10.228***	1.178	4.260***
Type of facility (rc: private & other)			
Public	39.355***	0.763	7.568***
Quality of care (rc: low)			
High	0.742	1.528	1.204
Cost per episode (rc: low)			
Medium	2.110	4.312***	2.652***
High	5.740***	3.372***	3.346***

*rc: reference category, HH: Head of the household, ***p<0.01, **p<0.05, *p<0.10*

8.2.1. Characteristics of the subject

Tables 57 and 58 show results of logistic regression analyses (LRA henceforth). Table 57 shows β coefficients and table 58 shows odds ratios. While interpreting results we will, however, look at the odds ratios of table 58 interpretations of which are straightforward. The odds ratio of older age group in the rural category, when it is compared with the 'under 5 age group', is 4.177. It conveys that a change in the category of age group from 0-4 (category: 0) to 15+ (category: 1), holding other variables constant (henceforth we will not mention it), multiplies the odds by 4.177 (a 317.7 per cent increase). This effect is statistically significant at 0.01 level. It expresses that likelihood of utilising a care from modern source (henceforth utilisation only) by morbid persons in the older age group is significantly higher than that of children in the 'under 5 age group'. Similarly, odds ratio is 2.597 times higher if we consider the combined category (rural and urban areas together). The effect of age towards utilisation of a care is insignificant in the urban areas of the districts.

As of ethnicity, people belong to the 'General Caste' category are likely to utilise care more both in the rural and the combined categories. Odds ratios of the 'General Caste' category are more than 2 and 1.5 times higher as compared to the 'Scheduled Caste' and 'Tribe' categories.

The effect of family size is statistically significant in the rural and combined categories. Patients from larger families (when compared with the small families) are notably less probable to utilise a care from modern source. When category changes from small (category: 0) to large (category: 1), odds ratio decreases by 191.545 per cent [(1 – 0.343) / 1 = 191.545] in rural and 111.864 per cent [(1 – 0.472) / 1 = 111.864] in the combined categories respectively.

'Normal out-of-door trips' has been found to be a very important determinant of utilisation of a care. Patients in the rural category, whose household heads travel more within 10 kms range, are highly probable to utilise a care. The same is true in the combined category, though the effect is not so strong.

'Agricultural possessions' has significant effect in the urban category only. Living in an urban set up those who posses more agricultural assets are markedly less probable to utilise a care as the odds ratio decreases by 138.095 per cent [(1 – 0.420) / 1 = 138.095].

Effect of 'Cash income' is significant in the urban areas and in the combined category where members of high-income families are likely to utilise care more.

Gender, education, travel to long distant place, and standard of living index are found not significant enough to explain health seeking patterns in Cooch Behar and Jalpaiguri districts of North Bengal.

8.2.2. Characteristics of the disorder

Between the characteristics of the disorder, 'severity of illness' significantly affect utilisation pattern. People with high severity (when compared with people with low severity) are highly probable to utilise a care.

Pattern of morbidity has no significant impact on utilisation.

8.2.3. Characteristics of the service

Availability of health facilities (in the combined category only) is seen to have negative impact towards utilisation of a care. The underlying assumption was that in the urban areas health facilities are available. However, the result indicates that as compared to the people of the rural areas, urban dwellers are likely to avoid utilising a care from modern source. This points to higher incidences of self-treatment or family-treatment or other by the urban dwellers. On the contrary, higher chances of utilisation of care are there from modern sources in towns by the rural people who generally experience non-availability of health facilities in their local areas.

Preference for a system of medicine has been found a very important, which affect utilisation pattern. Odds ratio of utilisation increases tremendously in the rural category when the preference for system of medicine shifts from traditional (Category: 0) to homeopathy (category: 1). The same is true for allopathy also, but the impacts are relatively lower than those of homeopathy. The fact could be projected as – to the users of traditional systems of medicine, the first alternative system of medicine is homeopathy followed by allopathy. Similarly, preference for public health facility is highly associated with utilisation of care.

'Cost per episode' seems to affect utilisation positively. When cost of care per episode is medium or high, people are meant to utilise care from modern sources.

Quality of care has no significant impact on utilisation pattern.

8.3. Results of multiple classification analysis on utilisation of care

Table 59 shows results of multiple classification analysis (MCA henceforth).

8.3.1. Characteristics of the subject

In table 59 unadjusted and adjusted probabilities of utilising a care in the rural areas of the districts are 0.603 and 0.747 respectively for morbid children in the 0-4 age group. So, age alone (unadjusted) and with other variables also (adjusted) plays an important role towards utilising a care. Within this variable if we look at different categories, we can see that probability declines in the young age group and then increases in the older age group. It confirms one U-shaped relationship between age and utilisation of care. Similar relationship can be observed if we consider the combined category. The relationship is weak in the urban category.

If we look at pattern of utilisation of care with respect to gender, we will find some sort of gender bias according to the adjusted probabilities in table 59 where morbid males have more probability to utilise a care as compared to morbid females. The same is true for ethnicity also. Patients in the 'general caste' category have more probability of utilising a care as compared to the 'scheduled caste' and 'scheduled tribe' categories.

MCA also shows higher probabilities of utilisation in small families.

If we look at the contribution of education alone to the probability of utilising a care by looking at the unadjusted probabilities in the table, we can see that illiterate and primarily educated people have higher probability of utilising a care than that of people with moderate or higher education. By and large, adjusted probabilities also follow similar pattern.

If we assess the importance of 'travel to distant place', we can see that it is more important in rural areas. This particular individual behaviour has less bearing on the probability of utilising a care among the urban dwellers.

Other individual or household level characteristics follow similar pattern as analysed in the previous section of LRA.

8.3.2. Characteristics of the disorder

People with infectious and communicable diseases have higher probabilities to utilise a care than people with non-communicable diseases or injuries as in table 59. Similarly, probability increases gradually with 'severity of illness' in rural, urban and combined categories.

8.3.3. Characteristics of the service

People with the preference for Homeopathy have very high probability (0.956) of utilising a care in rural areas as in table 59. In urban areas, however, probability of utilising a care with respect to Homeopathy is significantly less (0.417). This clearly indicates preference for alternative systems of medicine among rural mass.

High-unadjusted probability of 0.972 corresponding to private-type of facility in the table indicates that in the absence of any other consideration rural people have tendency to opt for private type of care. However, this message may be very misleading if not interpreted with care. The indication of the result is something like a decision when someone takes it blindly. With all other considerations in a controlled situation, rural people are seen to favour public facilities. Adjusted probability with respect to preference for public type of care (0.985) is much higher than that of private care (0.622). The result is just reverse in the urban category where comparatively high-unadjusted probability goes in favour of the public health facilities and the adjusted probability favours private health facilities.

Adverting to the 'quality of care', we can see that people who reported low quality of care have higher probability of utilising a care from modern source in the rural category. On the other hand, people with high reported quality of care have higher probability of utilising a care in the urban category.

As of cost per episode, probabilities increase gradually with costs in the rural category. The relationship is inverted U-shaped in the urban category.

Table 59. Results of Multiple Classification Analyses (MCA)

Predictor Variable	Rural			Urban			Combined		
	n	U-P	A-P	n	U-P	A-P	n	U-P	A-P
Characteristics of the subject									
Age group									
Under five age group (0-4)	58	0.603	0.747	50	0.460	0.426	0.537	0.596	0.537
Young age group (5-14)	80	0.425	0.573	51	0.412	0.391	0.420	0.492	0.420
Older age group (15 and above)	187	0.818	0.925	57	0.526	0.553	0.750	0.793	0.750
Gender									
Female	159	0.692	0.825	58	0.431	0.388	0.622	0.645	0.622
Male	166	0.675	0.866	100	0.490	0.503	0.605	0.708	0.605
Caste									
General	200	0.680	0.882	130	0.485	0.473	0.603	0.712	0.603
Scheduled Caste & other	125	0.688	0.772	28	0.393	0.404	0.634	0.609	0.634
Family size									
Small (≤ 5)	171	0.760	0.902	99	0.505	0.489	0.667	0.748	0.667
Large (> 5)	154	0.597	0.758	59	0.407	0.411	0.545	0.583	0.545
Education of head of household									
Illiterate and up to primary	144	0.757	0.846	122	0.583	0.589	0.728	0.716	0.728
Middle and above	181	0.590	0.849	36	0.434	0.422	0.518	0.650	0.518
Normal out-of-door trips									
Less	81	0.444	0.569	121	0.463	0.438	0.455	0.540	0.455
More	244	0.762	0.899	37	0.487	0.535	0.726	0.766	0.726
Travel to distant place									
No	163	0.656	0.829	50	0.460	0.420	0.610	0.637	0.610
Yes	162	0.710	0.864	108	0.472	0.479	0.615	0.712	0.615
Standard of living index									
Low	225	0.675	0.827	57	0.474	0.529	0.592	0.660	0.592
High	100	0.700	0.885	101	0.466	0.422	0.653	0.707	0.653
Agricultural possessions									
Low	69	0.652	0.865	113	0.513	0.521	0.595	0.731	0.595
High	256	0.691	0.842	45	0.355	0.313	0.622	0.647	0.622
Cash income									
Low	147	0.694	0.857	14	0.286	0.280	0.596	0.681	0.596
Medium	132	0.689	0.861	46	0.326	0.313	0.583	0.647	0.583
High	46	0.630	0.756	98	0.561	0.561	0.658	0.719	0.658

Continued on page 138

Continued from page 137

Characteristics of the disorder									
Type of illness									
Group I	187	0.743	0.869	26	0.538	0.512	0.642	0.716	0.642
Group II	97	0.588	0.806	86	0.453	0.464	0.572	0.654	0.572
Group III	41	0.634	0.829	46	0.456	0.424	0.578	0.645	0.578
Severity of illness									
Low	121	0.573	0.752	45	0.474	0.455	0.542	0.574	0.542
Medium	122	0.631	0.780	73	0.423	0.471	0.550	0.654	0.550
High	82	0.810	0.929	40	0.548	0.446	0.742	0.774	0.742
Characteristics of the service									
Availability									
No (rural)	-	-	-	-	-	-	0.683	0.735	0.683
Yes (urban)	-	-	-	-	-	-	0.468	0.554	0.468
System of medicine									
Traditional	58	0.448	0.682	22	0.450	0.378	0.435	0.486	0.435
Allopathy	197	0.706	0.818	92	0.466	0.501	0.654	0.675	0.654
Homeopathy	70	0.814	0.956	44	0.489	0.417	0.657	0.801	0.657
Type of facility									
Public	107	0.541	0.985	18	0.500	0.401	0.809	0.905	0.809
Private	218	0.972	0.622	140	0.464	0.468	0.514	0.557	0.514
Quality of care									
Low	248	0.694	0.856	70	0.400	0.402	0.590	0.667	0.590
High	77	0.649	0.815	88	0.523	0.507	0.677	0.707	0.677
Cost per episode									
Low	219	0.635	0.794	86	0.349	0.317	0.539	0.589	0.539
Medium	67	0.791	0.890	34	0.588	0.667	0.755	0.792	0.755
High	39	0.751	0.957	38	0.632	0.611	0.807	0.827	0.807

8.4. Summary

Among the characteristics of the subject in rural areas of the districts, age, ethnicity, family size, and 'normal-out-of-door activities', are found to have significant impact on pattern of utilisation of care. As compared to the children (0-4), morbid persons in the 15+ age group utilises care more from modern sources. People belong to the 'general caste' category are also likely to utilise care more from modern sources relative to the 'scheduled caste' and 'scheduled tribe' categories. Size of family is negatively related

with utilisation of care from modern source as, households from large families are likely to utilise care from traditional source. Utilisation of care from modern source increases for households whose heads make frequent normal out-of-door trips. Agricultural possession has negative, and income has positive impacts on utilisation of care from modern source in urban areas of the districts. Between the characteristics of disorder, severity of illness is positively related to utilisation of care from modern source. Among the characteristics of the service, availability of health facilities is negatively, and preference for allopathy (relative to traditional ones) in the combined category and that of Homeopathy (relative to traditional ones) in the rural category is positively related to utilisation of care from modern source. Similarly, preference for public sources of care is positively related to utilisation of care from modern source in the rural areas of the districts.