

ECONOMICS OF HEALTH CARE: A STUDY OF HEALTH SERVICES UTILISATION IN COOCH BEHAR AND JALPAIGURI DISTRICTS OF NORTH BENGAL*

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1. Introduction

Health care economy at present is passing through a phase of transition in the region of North Bengal with other parts of India. Important changes which draw our attention are: introduction of user fees or more specifically hike in fees structure in the public health facilities, emergence of numerous private sources of care, and revealed preference for alternative systems of medicine. The present study applies econometric tools to investigate such facts empirically in the rural and urban areas of Cooch Behar and Jalpaiguri districts of North Bengal. It does multiple classification analysis to reach meaningful conclusion.

The public health care delivery system in India at present has a three-tier structure. The primary tier, in rural areas of the country comprises three types of health care institutions: Sub-Centre (with 3 health workers and 1 voluntary worker), Primary Health Centre (with 4-6 beds, 1 doctor, and 14 other paramedical and supporting staff), and Community Health Centre (with 30 beds, 4 medical specialists, and 21 other paramedical and supporting staff). The secondary tier, which is primary to the urban mass, includes medical care provided by the specialists at the sub-divisional and district hospitals. Tertiary health care encompasses sophisticated services provided by the super-specialists at medical colleges and specialised hospitals (GOI 1997, VHAI 1997). As of systems of medicine, at present with the mainstream system of Allopathy five other systems such as Ayurveda, Unani, Siddha, Naturopathy and Yoga, and Homoeopathy are practiced officially (GOI 2002).

Private sources of care may be divided into two broad groups: institutional and non-institutional. Institutional sources include private hospitals, private health care research institutes, nursing homes, private clinics, etc. Non-institutional sources include doctors and medical specialists of public health care institutions who do private practice, indigenous practitioners of Allopathy or traditional healers of alternative or even unrecognised systems of medicine, chemists, druggists, etc. However, private sources of care are very uneven in both quantity and quality and their presence is parallel to the public health care system.

2. Review of literature

Economists began to turn their attention to the matters concerning the efficiency in the health service sector around the end of the 1950s (Culyer 1971). Much of the controversies regarding application of economics to health care

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analysis waned when Fuchs (1966) defined health service sector as health care industry, which provides different types of outputs such as medical services, hospitality or hotel services, and validation services to people utilising different inputs. These services are output of the health care industry measured in terms utilisation of health facilities, e.g., number of cases treated, hospital admission, etc. (Feldstein 1967a & Feldstein 1967b). The inputs of health care industry as categorised by Fuchs (1966) are: labour input (manpower), physical capital (plant and equipment), and intermediate goods and services (drugs, bandages, etc.). Empirical studies within this framework of supply-side economics of health care began with the work of Feldstein (1967a). He opened new avenues of research by estimating Cobb-Douglas type production function of hospitals for the British National Health Service. Studies in the demand-side of health care economics also follow a similar framework, which considers a set of non-economic factors such as age, gender, education, culture, etc. with the economic ones (see Feldstein 1967b and Feldstein 1979). Utilisation of health services depends both on demand and supply of consumers and providers (Lee and Mills 1983). Studies on utilisation of health services fall under a mixed demand-supply framework.

2.1. Demand-side factors

In the demand-side, age, gender, household size, marital status are very important determinants of utilisation of health services. According to Feldstein (1979) as illness is an unexpected occurrence, it may be considered as a random event, but it has a fair degree of predictability with respect to age and gender. As age increases, incidence of illness increases and morbidity pattern changes. The need for medical care also differs among men and women. So, the pattern of utilisation of health care will also vary with different age groups and gender. In a large family per capita income may be less and so also ability to pay for health care. It may reduce chances of utilising a care from modern source. On the contrary in larger families interaction among the members or with the neighbours may be more intensive and which may increase chances of utilising a care (Feldstein 1979, Pathak et al. 1983, Yesudian 1989).

Impacts of education, employment and ethnicity towards utilisation of services have been explored by Abu-Zeid and Dann (1985), Amin et al. (1989) Elo (1992), Gobindasamy and Ramesh (1997), Kavitha and Audinarayana (1997), and Matsumura and Gubhaju (2001). They found significant positive relationship between education and utilisation of maternal and child health care services. Occupation and ethnicity have also been found important determinants of utilisation in the above-mentioned studies.

The relationship between family income or wealth and utilisation of health care is quite unexplored in India. Significant studies on health services utilisation in India considered maternal and child health care services, which are very basic, and utilisation of those are thought independent of household income. Studies in general found positive relationship between household income and utilisation of services (Abu-Zeid and Dann 1985, Dunlop et al. 2000). Celik and Hotchkiss (2000) found having a car, flush toilet and modern floor are positively associated with utilisation. Studies on health care expenditure found that income elasticity of demand is less than one meaning that demand increases less than proportionately (Sodani 1999). As of psychological demand (or need), the intensity of illness and number of spells significantly affect utilisation of health care services. Higher the severity or number of spells the higher the degree of utilisation

utilisation of services (Pathak et al. 1981, Sauerborn et al. 1989). Study by Dunlop et al. (2000) on Canada's universal health care system also demonstrated positive relationship among health need (measured by perceived health status and number of health problems) and the use of primary care services.

2.3. Supply-side factors

Feldstein (1967a) explained variations in utilisation of services by availability factors. For all the production functions he found that elasticity coefficients of medical inputs, beds, drugs and dressings are positive. It means that hospital output increases with the inputs. Sauerborn et al. (1989) and Vogel and Stephens (1989) also found that availability of drugs, pharmaceuticals are important determinants of utilisation of care.

Increased distance between residents and health care providers is commonly thought to decrease the utilisation of health care. Empirical studies by geographers in Africa established a distance-decay relationship between remoteness of a health facilities and utilisation of services (Freeman et al. 1983, Francis 1984, Mooney et al. 2000). However, the study by Ramachandran and Shastri (1983) in India did not support these findings. They found no significant relationship between distance travelled and utilisation of health care. However, recent theoretical developments in the geography of health set the stage to discuss a more nuanced relationship between distance and health care utilisation. Nemet and Baily (2000) think that distance may take different meaning to different individuals. It is important to consider how population 'construct' the barrier effects of distance in experience of rural life. They have operationalised the idea by working out activity space for each individual considering normal out-of-door trips made by the potential patients to market place, groceries, etc. The study found statistically significant association between utilisation and location of physician relative to activity space. They have concluded that variation in utilisation rates seems more closely linked to a broader web of spatial relations – the activities of daily life—than any marker (distance).

According to Donabedian (1980), the doctor-patient relationship particularly in the areas of patient access to information about their health care, in some quarters the patient's satisfaction with availability and accessibility of services, is considered a valid indicator of the quality of the medical care. The importance of doctor-patient information exchange has also been boosted up by Schoenbaum (1998). He feels that the art of medicine is equally important as the science of it. The science of medicine is what determines the process most likely to help a patient recover from a clinical condition. One facet of the art of medicine is enhancing the ability of physicians to establish trusting relationships with patients, relationships that will enhance compliance with scientific practices and lead to better outcomes. Probably many physicians simply find it easier to order a test or treatment than to have a 'difficult' discussion with the patient.

The price of a service and use of that service are, according to economic theory, inversely related: as price is reduced, purchase or use of the service will increase. Knowledge of price elasticity of demand for medical services is, therefore, of great importance. In health economics literature, cost of a care is divided into three parts: the reduction in market income caused by disease, the reduction in longevity caused by disease, and the reduction in psychological well being caused by disease, often labelled 'pain and suffering,' even when

there is no reduction in market income. The reduction in market income has at least four sub-components: the cost of medical treatment, the loss of labour market income from a episode of illness, the loss of adult earning power from episodes of disease in childhood, and the loss of future earnings from premature mortality (WHO 2001). Studies, in general, take the following components to measure cost of a care: doctors fee, hospital admission fee, cost of drug, cost of medical test, cost of surgery as direct cost and cost of special diet, cost of transport, tips, rituals, monetary loss of earnings to patient due to illness and loss of earnings to accompanying persons for providing support as indirect cost (see Weisbord 1960, Vinni 1983, Sodani 1997). However, the effect of price or costs towards utilisation of health services has not been explored so much in developed and in developing countries because of the complexity of the concept in health care. Moreover in many developed countries, part or the entire price is paid by the third party payer or by the government on patient's behalf. Any estimate of price elasticity of demand should be based upon the net or out-of-pocket price paid by the patient. Insurance coverage represents a movement down the patient's demand curve, which increases the quantity of services demanded. Health insurance may have positive impact on utilisation but elasticity of demand for health care with respect to health insurance does not confront to the price elasticity of demand (Feldstein 1979). Many African nations have adopted the recommendation of the World Bank on increased cost recovery for financing publicly provided health services and gradually introducing user fees (Shaw 1995). However, utilisation dropped in many instances after user fees were introduced. When quality improvements were coupled with the introduction of user fees, utilisation increased after fees were raised (Reerink and Sauerborn 1996).

Studies on impact of cost or user fees on utilisation are sparse at national level and also of the studies that has been done, the findings are mixed. Many experts in medical care have generally assumed that prices affect medical service use very little (Yoder 1989). Yoder have presented seven different studies in health demand and utilisation in developing countries at sub-national level and come to the conclusion that in general the price of services does not matter, having a minimal (if any) effect on the decision to seek health care. In the Philippines and Malaysia, it was found that price had a minimal effect on the demand for health services. In Kenya, however, it was found that cash price is a deterrent to health care use. In another study in Mali it was found that price elasticity of demand is -0.017 , which suggests that there would be little or no change in the expenditure pattern as a result in changes in price, holding other things constant.

Yoder (1989) has also presented results of his study conducted in Swaziland. In Swaziland, health care services are provided by government and church missions through not-for-profit health facilities. User fees at government health facilities were far below than those of mission hospitals. In October 1984, government introduced a new fee structure mainly to equalise the fees charged by the two sectors. He has compared average patients' attendance rates (in health facilities) of October-December 1983 and October-December 1984 and at the second stage attendance rates of January 1984 and September 1985. In the first year, after the revision of fees structure, attendance in government facilities reduced by 32.4 per cent and in the second year 38.5 per cent. On the contrary, attendance in mission facilities has increased by 10 per cent in the first year and 1 per cent in the second year. The instance of

government facilities clearly indicates a negative relationship between user fees and utilisation. If government and mission facilities are taken together then from January 1984 to September 1985 average attendance rates has decreased by 17 per cent. Utilisation increased in mission health facilities at the cost of that in government health facilities perhaps due to better quality of care in the former than in the latter.

Freeman et al. in Calabar, Nigeria (1983), Sauerborn et al. in Burkina Faso (1989), Celik and Hotchkiss in Turkey (2000) found respectively that cost of travel; cost of travel and drugs; health insurance were important service related determinants.

4. Data

The study is based on primary data collected through interview technique with mostly a structured and close-ended questionnaire. The survey has been conducted in Sadar sub-divisions of Cooch Behar and Jalpaiguri districts of North Bengal taking 14 villages and 8 wards from rural and urban areas respectively. Twenty households have been selected from each village / ward leading to the total size of sample as 440 households or 2342 persons. However, there are 325, 158, and 483 cases or illness episodes, which have been included in the analyses in the rural, urban, and the combined categories respectively. The reference period for data collection has been 5 months. Data on illness has been collected adopting a self-perceived morbidity method based on the perception and reporting of symptoms and impairments by individuals (Murray and Chen 1992) considering three broad categories of diseases as recommended by the Global Burden of Disease study 1990 (Murray and Lopez 1996).

4. Method

4.1. Conceptual framework

Utilisation of services may be considered as an event (Béland 1988). 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 staff 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 always be not 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 in the rural areas health facilities are not easily available but available in urban areas. Definitions of the response and predictor variables are shown in table 1.

4.3. The model

If P be the estimated probability of utilising public health facilities, in probability form, the model is

$$P = \frac{1}{1 + e^{\beta_0 + \sum \beta_{1i} X_{1i} + \sum \beta_{2i} X_{2i}}} \quad \dots \quad \dots \quad (i).$$

The equations include demand (X_{1i}), and supply-side (X_{2i}), factors. Three separate models will be estimated for the rural, urban, and combined categories respectively.

The results of the above logistic regression models will be transformed into simple cross tabulation of the probability of utilising health care using multiple classification analysis. This will involve calculation of adjusted and unadjusted values of the response variables for each category of predictor variables. Unadjusted probability (of utilising a care) means the effect of one particular variable towards pattern of utilisation of a care when all other predictor variables are absent in the model. Adjusted probability (of utilising a care) means the effect of one particular variable towards pattern of utilisation of a care when all other predictor variables are controlled at their mean values. As a result the set of controlled variables change as we move down the table (Retherford and Choe 1993).

5. Results

5.1. Demand-side factors

Table 2 shows results of multiple classification analyses (MCA). The second and third columns show that unadjusted and adjusted probabilities of utilising a care in the rural category are 0.603 and 0.747 respectively for morbid children in the 0-4 age group. Within this variable, if we look at different categories, we can see that probabilities decline in the young age group and then increase in the older age group. It confirms one U-shaped relationship between age and utilisation of care. The relationship is weak in the urban category as shown in the same table. If we are to look at gender differences in probabilities of utilisation of care, we find some sort of gender bias in the urban category, where morbid males have more probability of utilising a care. The same is true for ethnicity also. Patients in the 'general caste' category have more probability of utilising a care as compared to the 'schedule caste' and '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 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. 'Normal out-of-door trips' also increases the chances of utilisation of a care both in rural and urban areas. 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. High agricultural possessions and standard of living is positively and negatively related in rural and urban areas respectively. The impact of cash income towards utilisation is just opposite to the cases of its proxy measures (agricultural possessions and standard of living). People with infectious and communicable diseases have higher probabilities to utilise a care than people with non-communicable diseases or injuries. Similarly, probability increases gradually with severity of illness in all the categories.

5.2. Supply-side factors

People with the preference of Homeopathy have very high probability of utilising a care in rural areas. In urban areas, however, probability of utilising a care with respect to Homeopathy is significantly less. This clearly indicates preference for alternative systems of medicines among rural mass. As of type of care, high-unadjusted probability of 0.972 indicates that in the absence of any other consideration rural people have a 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 the public health facilities. Adjusted probability with respect to preference for public type of care is 0.985, which is much higher than that of 0.622 with respect to the private ones. 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 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. With respect to cost per episode, probabilities increase gradually with costs in the rural category. The relationship is inverted U-shaped in the urban category. Availability of health facilities 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 out higher chances 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 unavailability of health facilities in their local areas.

6. Summary and conclusion

Among the characteristics of the subject, demographic factors like age, and family size has been found important determinants of utilisation of care from modern source. MCA shows that children in the 5-14 age group are by and large neglected. We have observed U-shaped relationship between age and probability utilisation of a care. Special care must be taken to raise the rate of utilisation of care for morbid children in the 5-14 age group and also in all other groups so that the probabilities of utilisation for all the age groups tend to one. Probability of utilisation is seen higher in small families. We have gone through literature in support of this fact, which theorises that in small families per capita income may be high and which may

increase ability to pay for health care and chances of utilisation of a care. But MCA shows that even if the effects of income and other variables are controlled, probability of utilising a care is higher in small families in rural and urban areas than in large families. Appropriate measure should be taken to regularise the habit of utilisation of health care in large families. Though not very sharp, some sort of gender biasness is there both in rural and urban categories. Policy makers must take note for removal of it, as there should not be any gender biasness in economic agents particularly in this phase of liberalisation and globalisation.

Negative relationship between education and utilisation of a care indicates chances of preferring self-treatment or family-treatment or like among the educated ones. Though the gaps in probabilities between the illiterates (or primarily educated) and educated decrease in the controlled situations, it is a matter of concern for both the policy makers and the service providers. Regarding 'normal out-of-door trips', it has been found that those who (household head only) make frequent trips, have a tendency to utilise care more. It carries a good message as in the pace of development social mobility will increase which will always contribute to the probability of utilising a care. Relationship between probability of utilisation and cash income is some sort of negative in the rural category and positive in the urban category. The negative relationship indicates preference for self-treatment or family-treatment or like among the affluent households. Policy makers and service providers must note this fact with care. Probabilities of utilising a care, for three broad categories of diseases, in the rural category follow a U-shaped pattern. In other words, infectious diseases, etc. and injuries get more importance over non-communicable diseases. Urban dwellers also put more importance on infectious diseases, etc. and it then decreases gradually. This again indicates chances of self-treatment or family-treatment or like for non-communicable diseases, and injuries. This is either for longer duration of illness episode or for their perception about incompetence of the available health care facilities. Probability of utilisation is very high in the rural category when the preference is for Homeopathy. As the demand for Homeopathy is very high, appropriate measures should be taken to introduce it in the primary health care system. Similarly, demand for public health facilities is also very high among rural mass. So, privatisation or plan of leasing out the primary health care system to private operators will not be justified. Utilisation of health facilities by rural people is associated with low reported quality of care. The reverse is true in for the urban dwellers. This conveys that unhappiness during sickness aggravates in case of a patient from a rural area for service related factors. Service providers should consider this fact from moral point of view. The relationship between cost and utilisation (in the adjusted category) is positive in the rural category and almost inverted U-shaped in the urban category. One possible reason behind this fact may be that rural people have less opportunity to find cheaper options in the towns, which are not their usual places of residence, and on the contrary, this (finding cheaper options) may be a common practice among urban dwellers. Other reasons may include added cost of travel, cost of accompanying persons, etc. in case of rural residents. Though there is no simple mechanism to minimise these inequalities between rural and urban communities, policy makers should rationalise these facts by taking price-discrimination policies, etc. These are some effective measures,

which this study would like to propose towards appropriate matching of people's desire and the mettle of health care economy to safeguard our common future.

Reference

- Abu-Zeid, H. A. H. and William M. Dann. (1985). Health Services Utilisation And Cost In Ismailia, Egypt. *Social Science and Medicine* 29 (4): 451 – 461.
- Amin, R., S. A. Chowdhury., G. M. Kamal., and J. Chowdhury. (1989). Community Health Services And Health Care Utilisation In Rural Bangladesh. *Social Science and Medicine* 29 (12): 1343 – 149.
- Béland, F. (1988). Utilisation of Health Services as Events: An Exploratory Study. *Health Services Research* 23 (2): 295-310.
- Boscarino, J. A. (1996). Patients' Perception of Quality Hospital care and Hospital Occupancy: are there Biases Associated with Assessing Quality care based on patients' Perceptions? *International Journal for Quality in Health Care* 8 (5): 467 – 477.
- Celik, Y. and D. R. Hotchkiss (2000). The socio-economic determinants of maternal health care utilisation in Turkey. *Social Science and Medicine* 50 (12): 1797 - 1806.
- Culyer, A. J. (1971). Is Medical Care Different? In M. H. Cooper and A. J. Culyer (ed.). *Health Economics*. Penguin Books, Middlesex.
- Donabedian, A. (1980). *Explorations in Quality Assessment and Monitoring. Vol. 1*. Health Administration Press, Ann Arbor.
- Dunlop, S. , P. C. Coyte., and W. McIsaac. (2000). Socio-economic status and the utilisation of physicians' services: results from the Canadian National Population Health Survey. *Social Science and Medicine* 51 (1): 123 – 133.
- Elo, I. T. (1992). Utilisation of maternal health-care services in Peru: the role of women's education. *Health Transition Review* 2 (1): 1 – 20.
- Feldstein, M. S. (1967a). *Economic Analysis for Health Service Efficiency: Econometric Studies of the British National Health Service*. North-Holland, Amsterdam.
- Feldstein, M. S. (1967b). An aggregate planning model of the health care sector. *Medical Care* 5: 369-381.
- Feldstein, P. J. (1979). *Health care Economics*. John Wiley & Sons, New York.
- Francis, B. J. (1984). Accessibility to general hospital in rural Bendel, Nigeria. *Social Science and Medicine* 18 (8): 651-660.
- Freeman, D. H. (1983). A categorical data analysis of contacts with the family health clinic, Calabar, Nigeria. *Social Science and Medicine* 17 (9): 571-578.
- Fuchs, V. R. (1966). The contribution of health services to the American Economy. *Milbank Memorial Fund Quarterly* 44: 65-101.
- Gobindasamy, P. and B. M. Ramesh. (1997). Maternal Education and the Utilisation of Maternal and Child Health Services in India. National Family Health Survey Subject Reports, Number 5. International Institute for Population Sciences, Mumbai, Macro International Inc. U. S. A.
- GOI. 1997. *Bulletin On Rural Health Statistics*. Government of India, New Delhi.
- GOI. (2002). *National Health Policy*. Government of India, New Delhi.
- Kavitha, N. and Audinarayana. (1997). Utilisation And Determinants Of Selected MCH Services In Rural Areas Of Tamil Nadu. *Health and Population – Perspectives and Issues* 20 (3): 112 - 125.
- Lee, K. and A. Mills. (1983). Economics of health in developing countries: a critical review. In Lee, K. and Mills, A. (ed.). *Economics of health in developing countries*. Oxford University Press, Oxford.
- Matsumura, M. and B. Gubhaju. (2001). Women's Status, Household Structure and the Utilisation of Maternal Health Services in Nepal. *Asia Pacific Population Journal* 16 (1): 23 – 44.
- Mode (1998). *Rapid Household Survey Under RCH Project Phase – I (Koch Behar)*. Mode Research Pvt. Ltd., New Delhi.
- Mode. (1999). *Rapid Household Survey Under RCH Project Phase – II (Jalpaiguri)*. Mode Research Pvt. Ltd., New Delhi.

- Mooney, C. et al. (2000). Is travel distance is a barrier to veterans' use of VA hospitals for medical surgical care? *Social Science and Medicine* 50 (12): 1743 – 1755.
- Murray C. J. L. and L. C. Chen (1992). Understanding morbidity Change. *Population and Development Review*. 18 (3): 481-501.
- Murray, C. J. L. and A. D. Lopez (ed.). 1996. *The Global Burden of Disease: A Comprehensive Assessment of Mortality and disability from Diseases, Injuries, and Risk Factors in 1990 and Projected to 2020*. Cambridge, MA: Harvard University Press.
- Nemet, G. F. and A. J. Bailey. (2000). Distance and health care utilisation among the rural elderly (in USA). *Social Science and Medicine* 50 (9): 1197 – 1208.
- Pathak, M., Y. A. Ketkar., and R. D. Majumdar. (1981). Perceived morbidity, utilisation of health services and factor affecting it in a rural area. *Health and Population - Perspective and Issues* 4 (1): 79 - 85.
- Ramachandran, H. and G. S. Shastri. (1983). Movement For Medical Treatment – A Study In Contact Patterns Of A Rural Population. *Social Science and Medicine* 17 (3): 177 – 187.
- Retherford, R. D. and M. K. Choe. (1993). *Statistical Models for Causal Analysis*. John Wiley & Sons. Inc., New York.
- Sauerborn, R. , A. Nougara., and H. J. Diesfeld. (1989). Low Utilisation Of Community Health Workers: Results From A Household Interview Survey In Burkina Faso. *Social Science and Medicine* 29 (10): 1163 – 1174.
- Schoenbaum, S. C. (1998). Improving the art and science of medical practice. *Social Science and Medicine* 10 (2): 81 – 82.
- Shaw, R. P. and A. Martha. (ed) (1995). *Financing Health Services through User Fees and Insurance Case Studies from Sub-Saharan Africa*. The World Bank. Washington, D. C.
- Sodani, P. R. (1999). Determinants of Demand for Health Care in the Surveyed Tribal Households of Selected Three Districts of Rajasthan. *Demography India* 28 (2): 257-271.
- VHAI. (1997). *Report of Independent Commission on Health in India*. Voluntary Health Association of India. New Delhi.
- Vinni, K. (1983). Productivity Losses Due To Illness, Disability And Premature Death In Different Occupational Groups In Finland. *Social Science and Medicine* 17 (3): 163-167.
- Vogel, R. J. and B. Stephens. (1989). Availability Of Pharmaceuticals In Sub-Saharan Africa: Roles Of The Public, Private And Church Mission Sectors. *Social Science and Medicine* 29 (4): 479 – 486.
- Weisbord, B. A. (1960). *Economics of Public Health*. University of Pennsylvania Press, Philadelphia.
- WHO. (2001). *Macroeconomics And Health: Investing In Health For Economic Development*. World Health Organisation, Geneva.
- Yesudian, C. A. K. (1989). *Health Services Utilisation in Urban India*. Mittal Publications, Delhi.
- Yoder, R. A. (1989). Are People Willing And Able To Pay For Health Services? *Social Science and Medicine*. 29 (1): 35-42.

Table 1. Variables in the model and definitions

Variable	Definition	Value
Utilisation of care	Whether the household utilised care from any modern source	1 if the event has occurred 0 Otherwise
Age	Age of the morbid person (0-4, 5-14, and 15+)	1 if age 5-14 0 otherwise; 1 if age 15+ 0 otherwise
Gender	Gender of the morbid person	1 if female 0 otherwise
Caste	Caste of the morbid person (General / Scheduled caste / Tribe)	1 if general 0 otherwise
Family size	Number of persons in the household	1 if size \leq 5 0 otherwise
Education	Education of the head of the household	1 for illiterate and up to primary 0 for middle and above
Normal out-of-door trips	Number of travels by the head of the household within 10 kms range in a month	0 if number \leq 4 1 otherwise
Travel to distant places	If the head of the household traveled beyond 500 kms range in past three years	1 if the event has occurred 0 Otherwise
Standard of living	A composite index based on proportion of living rooms to persons (1 if proportion \geq 0.5, 0 otherwise), type of house (1 if pucca or semi-pucca, 0 otherwise), type of toilet facility (1 if sanitary, 0 otherwise), audio system (1 if yes, 0 otherwise), TV (1 if yes, 0 otherwise)	1 if score $>$ 3 0 otherwise
Agricultural possessions	If the household possesses cultivable land, milch animals, draft animals, birds, and fruit trees. For each item the score is 1 if the household possesses it, 0 otherwise	1 if score $>$ 3 0 otherwise
Cash income (in Rupees)	Household monthly cash income from all sources ($<$ 2000, 2000-4999, 5000 +)	1 if $2000 \leq$ income \leq 4999 0 otherwise; 1 if income \geq 5000 0 otherwise
Type of illness	Morbidity (Group I: Communicable, Maternal, Perinatal, and Nutritional diseases. Group II: Non-communicable diseases. Group III: Unintentional injuries, Intentional injuries)	1 for Group II 0 otherwise; 1 for Group III 0 otherwise
Severity	How sever the attack is (Low, Medium, and High)	1 for medium 0 otherwise; 1 for high 0 otherwise
Type of facility	Public / private / other	1 for public 0 otherwise
System of medicine	Allopathy / Homeopathy / Traditional (Traditional: Ayurvedic, Kabiraji, etc.)	1 for Allopathy 0 otherwise; 1 for Homeopathy 0 Otherwise
Quality of care	Composite index on households opinion on cleanliness (yes/no), whether privacy is maintained (yes/no), service provider listen to the patient/other (yes/no), service provider talk to the patient/other (yes/no), and the household is satisfied (yes/no). For each item the score is 1 if the answer is yes, 0 otherwise	1 if score $>$ 3 0 otherwise
Costs (in Rupees)	Total direct cost per episode ($<$ 100, 100-499, and 500 +)	1 if $100 \leq$ cost \leq 499 0 otherwise; 1 if cost \geq 500 0 otherwise
Availability of health facilities	It is assumed that health facilities are available in urban areas, relative to rural areas	1 if Yes, 0 otherwise

Table 2. Results of Multiple Classification Analyses (MCA)

Predictor Variables	Categories	Rural			Urban			Combined		
		n	U-P	A-P	n	U-P	A-P	n	U-P	A-P
Age group	(0-4)	58	0.603	0.747	50	0.460	0.426	108	0.537	0.596
	(5-14)	80	0.425	0.573	51	0.412	0.391	131	0.420	0.492
	(15 +)	187	0.818	0.925	57	0.526	0.553	244	0.750	0.793
Gender	Female	159	0.692	0.825	58	0.431	0.388	217	0.622	0.645
	Male	166	0.675	0.866	100	0.490	0.503	266	0.605	0.708
Caste	General	200	0.680	0.882	130	0.485	0.473	330	0.603	0.712
	Other	125	0.688	0.772	28	0.393	0.404	153	0.634	0.609
Family size	Small (≤ 5)	171	0.760	0.902	99	0.505	0.489	270	0.667	0.748
	Large (> 5)	154	0.597	0.758	59	0.407	0.411	213	0.545	0.583
Education of head of the household	\leq Primary	144	0.757	0.846	122	0.583	0.589	266	0.728	0.716
	Middle +	181	0.590	0.849	36	0.434	0.422	217	0.518	0.650
Normal out-of-door trips	Less	81	0.444	0.569	121	0.463	0.438	202	0.455	0.540
	More	244	0.762	0.899	37	0.487	0.535	281	0.726	0.766
Travel to distant place	No	163	0.656	0.829	50	0.460	0.420	213	0.610	0.637
	Yes	162	0.710	0.864	108	0.472	0.479	270	0.615	0.712
Standard of living	Low	225	0.675	0.827	57	0.474	0.529	282	0.592	0.660
	High	100	0.700	0.885	101	0.466	0.422	201	0.653	0.707
Agricultural Possessions	Low	69	0.652	0.865	113	0.513	0.521	182	0.595	0.731
	High	256	0.691	0.842	45	0.355	0.313	301	0.622	0.647
Cash income	Low	147	0.694	0.857	14	0.286	0.280	161	0.596	0.681
	Medium	132	0.689	0.861	46	0.326	0.313	178	0.583	0.647
	High	46	0.630	0.756	98	0.561	0.561	144	0.658	0.719
Type of illness	Group I	187	0.743	0.869	26	0.538	0.512	213	0.642	0.716
	Group II	97	0.588	0.806	86	0.453	0.464	183	0.572	0.654
	Group III	41	0.634	0.829	46	0.456	0.424	87	0.578	0.645
Severity of illness	Low	121	0.573	0.752	45	0.474	0.455	166	0.542	0.574
	Medium	122	0.631	0.780	73	0.423	0.471	195	0.550	0.654
	High	82	0.810	0.929	40	0.548	0.446	122	0.742	0.774
System of medicine	Traditional	58	0.448	0.682	22	0.450	0.378	80	0.435	0.486
	Allopathy	197	0.706	0.818	92	0.466	0.501	289	0.654	0.675
	Homeopathy	70	0.814	0.956	44	0.489	0.417	114	0.657	0.801
Type of facility	Public	107	0.541	0.985	18	0.500	0.401	125	0.809	0.905
	Private	218	0.972	0.622	140	0.464	0.468	358	0.514	0.557
Quality of care	Low	248	0.694	0.856	70	0.400	0.402	318	0.590	0.667
	High	77	0.649	0.815	88	0.523	0.507	165	0.677	0.707
Cost per episode	Low	219	0.635	0.794	86	0.349	0.317	305	0.539	0.589
	Medium	67	0.791	0.890	34	0.588	0.667	101	0.755	0.792
	High	39	0.751	0.957	38	0.632	0.611	77	0.807	0.827
Availability of health facilities	No (Rural)	-	-	-	-	-	-	325	0.683	0.735
	Yes (Urban)	-	-	-	-	-	-	158	0.468	0.554

U-P: Unadjusted probability, A-P: Adjusted probability