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Determinants of Demand for Health Care in the Surveyed Tribal Households of Selected Three Districts of Rajasthan

Introduction

HEALTH care is fundamentally different from the usual commodities like, food, clothes, or any other commodity which is purchased by any individual. In the consumption of health care, for rationality to hold, the consumer must be ill, and most individuals would prefer not to be. This simple fact has significant consequences for the economic analysis of health care. Health care is tradable. A large number of marketable commodities affect health, but health care is consumed specially and singularly because of its relationship with health. Health care is only consumed on the presumption that it has investment benefits in health status.

Health is a critical investment for human resources development and poverty alleviation in India. Public policy for health has been based on an implicit assumption of health care as a basic right to which people should not be denied access on grounds of inability to pay or other socio-economic reasons. Yet, the resources provided by the government to achieve better health status through the provision of high priority primary health care services for the vast majority of the population have been inadequate. The goals have been achieved only to a very limited extent, despite the fact that India spends a higher percentage of its GDP on health care in comparison to other Asian countries that have achieved faster improvements in the health status of their peoples.

The continued escalation of health care costs as well as the growth of the egalitarian concept that all members of the society deserve adequate health care have spurred economists and other social scientists to study the health care sector of the economy

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extensively. A reliable estimate of the size and composition of national health expenditures is a basic input to rational health planning and policy development. The demand analysis seeks to identify which factors are the most influential in determining how much care people are willing to purchase. The better our understanding of these factors, the better will it be able to explain variations in utilisation among population groups and between areas. There have been various attempts to study the determinants of health care services utilisation [Sack (1980), Basu (1983), Abu-Zeid and Dann (1985), Amin *et al*. (1989), Marine/a/. (1989)andEllise/a/. (1994)] The present study is conducted in major tribal districts, namely Banswara, Dungarpur and Udaipur of Rajasthan with the three major objectives: (i) to identify the factors influencing the demand for health care; (ii) to estimate the demand function for health care; and (iii) to suggest suitable policy measures for better utilisation of health care facilities.

Methodology

Sample

The survey was conducted during the months of June-August 1996. Cross-section data is collected from a sample of 450 households through interview method. A total number of 150 households from each district, with 75 households from urban and 75 from rural areas are selected. Only those households in which at least one member had been reported sick during the 12 weeks preceding the date of survey are selected. From the selected household, out of 2442 total number of persons, 650 persons reported illness during the reference period of 12 weeks. The interview was conducted with head of the household or with any knowledgeable person of the family who could be able to respond. It is a one time survey and therefore cannot reflect the seasonal variations in the morbidity pattern. The study is based on lay-reporting of illness' and not on a clinical examination.

Demand for Health Care

The demand for health care depends largely on the existence and perception of physiological needs of the individual along with the willingness to meet the felt needs and ability to secure health care. A total of 11 variables are considered for estimation of the demand for health care which reflect the physiological needs, perception of needs, willingness to meet felt needs by securing health care, and ability to secure health care. The physiological need is measured by one variable i.e. the age of the sick person (in years) [XI: AGE]. The perception of need is also measured by one variable ie. the duration of illness episode (in days) [X4: DURATION]. The willingness to meet felt needs by securing health care is reflected by seven variables related to education, attitude

towards early care, proximity of the health care services utilised, visits made to contact the source of care and family size. Education is measured by three variables, namely, education of the sick person [X2: EDU], highest level of education among males in the household [X 10: EDUM], and highest level of education among females in the household [Xll: EDUF). Attitude towards early care is measured by one variable i.e. time gap between onset of disease and contact with source of care (in days) [X3: TIMEGAP]. Proximity of the health care services is measured by one variable i.e. distance of source of care from the residence of the household (in Km) [X6: DISTANCE]. Visits to source of care is measured by the variable i.e. the total number of visits made to source of health care during reference period [X5: VISIT]. Family size is again depicted by one variable i.e. the total number of living persons in the household [X8: FAMILYSIZE]. Finally, ability to secure health care is represented by two economic variables measured through the household monthly income from all sources (in Rs.) [X7: INCOME] and number of rooms in the house X8: ROOM] used as a proxy for asset variable. However, two other variables [X5: VISIT] and [X6: DISTANCE] can also reflect the ability to secure health care.

The total health care expenditure at the household is assumed to be influenced by all the above identified eleven variables. The total expenditure on health care includes expenditures incurred, during the reference period only, on all components of direct expenditure i.e. Doctors' fee, medicines, test charges, hospitalization fee, surgery; and indirect expenditure i.e. special diet, transportation, expenses on accompanying persons tips, rituals, monetary loss of earnings to patient due to illness and loss of earnings to accompanying persons for providing support/ company to the ill persons during the course of treatment.

Demand Functions for Health Care

Two types of functional forms are considered for estimation of the demand models; linear and log-linear. The Ordinary Least Squares (OLS) procedure which assumes ideal conditions of the disturbance term is used for the estimation of the demand models. In particular, it is assumed that random disturbance term (U) is normally distributed, has a mean of zero and constant (U) is also assumed to continue in the range of - a to + a and is distributed symmetrically around the mean. Hence the distribution of U is assumed to be fully determined by the mean and variance. Because rural and urban households reasonably behave differently in seeking health care, separate demand functions are estimated for investigating the difference between the two. Nevertheless, the set of the variables considered for evaluation of their impact on the demand for health care is the same for rural and urban demand functions. In all, 18 models are estimated; 12 on district level and 6 on regional level.

260 Results and Discussions

In this section results and discussions are presented in three parts: Part first presents the district level models for the rural and urban areas separately Part second deals with the region as a whole (the TSP region) for rural and urban areas; while the third part gives a comparative view of the models estimated in the two parts.

District Level Models

Banswara Rural: Table results obtained by regressing HEALTHEXP on all the 11 explanatory variables for rural areas of Banswara district depicts that for the linear model, five variables (X3, X4, X6, X8, and X9) have emerged out statistically significant at normal levels of test significance. The model explains a high proportion of the variance (R-Sq.= 0.80, Adj.R-Sq. = 0.77). The positive sign on the variables X4 (DURATION), X6 (DISTANCE), and X8 (ROOM) provide sufficient evidence that, health care expenditure is directly affected by these variables in rural areas of Banswara district. The positive nature of these variables suggest that duration of illness, distance traveled to contact source of care and high socio-economic status of the households increases the health expenditure. It might be because, the quality health care facilities are not available at a reasonable distance in the rural areas of Banswara district; people spend enough amount as travel expenses to obtain health care. The positive nature of the variable ROOM suggest that families of high socio-economic status of the rural areas of Banswara district spend more on health care. This could be surprising.

The negative sign on the variable, X3 (TIMEGAP) and X9 (FAMILYSIZE) describe the indirect effect on the health care expenditure in the rural areas of Banswara. In other words, it might be probably because the facilities are not available in the rural areas, therefore, people generally avoid contact with health care provider, it decreases the health care expenditure incurred by the rural families. The negative nature of the variable FAMILYSIZE reveals that the increase in the size of family decreases the expenditure on health care. In other words, higher number of persons in the household affects the expenditure on health care negatively. It might be because individuals living alone or in smaller families (nuclear families) cared more than those of living in families with more members (joint families).

Results of the log-linear model shows that regression with four variables (XI, X3, X5, and X6) are found to be statistically significant at normal level of test significance with positive sign on XI, X5 and X6 and negative sign on X3. This functional relation also shows high proportion of variation explained by the independent variables (R-Sq. = 0.64, Adj.R-Sq. = 0.59). In other words, health care expenditure incurred by the rural families is directly affected by the age of the sick person, number of visits made to source of care to seek care and distance travelled to contact the source of care. However the

expenditure is indirectly affected by the duration of time gap between onset of disease and contact with source of care, as evident in case of linear function also.

The estimated coefficients of the log-linear function depict the elasticity of health care expenditure with respect to explanatory Variables. The estimated health care expenditures elasticities with respect to explanatory variables are less than one, therefore their impact is said to be inelastic in nature. The estimated expenditure elasticities with respect to AGE is 0.21, TIMEGAP is -0.17, VISIT is 0.91 and DISTANCE is 0.47. In other words, a 100 per cent change in AGE, TIMEGAP, VISIT and DISTANCE would change the expenditure by around 21 per cent, 17 per cent, 91 per cent and 47 per cent respectively. Comparing the estimated elasticities for the rural areas of Banswara district, we find that elasticity of health care expenditure with respect to VISIT is higher than any of the other elasticities. Thus for the rural population of Banswara district VISIT is more important determinant in the health care expenditure. More visits increase the expenditure and vice-versa

Banswara Urban: Four variables (XI, X5, X6, and X10) of the linear model have emerged statistically significant with positive sign except X10, The positive signs on the variables XI (AGE), X5 (VISIT) and X6 (DISTANCE) reveal that these variables have direct effect on the health care expenditure incurred by the urban population of Banswara district. More age, more number of visits, and longer distances travelled to contact source of care in the urban areas (as in case of the rural areas) increase the expenditure. The VISIT and DISTANCE do not deter the urban population to avail desired health care services. The negative sign on the variable X10 (EDUM) explains that with better education among males in the family the expenditure on health care decreases. This may be because education makes the family members more cautious and therefore the quick recovery of the patient in the family brings down expenditure on health care.

In case of log-linear model four variables (X4, X5, X6, and XI 1) have emerged out statistically significant at normal level of test significance, with R-Sq. = 56% and Adj. R-Sq. = 50% of goodness of fit. The positive signs on the variables X4 (DURATION), X5 (VISIT) and X6 (DISTANCE) reveal that duration of illness episode, number of visits along with distance from the source of health care are directly related the expenditure on health care. These variables increase the expenditure on health care. On the other, negative sign on the variable X 11 (EDUF) reveals that the better education among the females in the household decreases the expenditure on health care in the urban areas of Banswara district. It is probably because of more educated females in the household seem to take appropriate and early care for the cure of illness of the family members and therefore the quick recovery of the patient in the family brings down the health care expenditure.

The coefficients of the log-linear function depict the elasticity of health care expenditure with respect to respective explanatory variables. The estimated expenditure

elasticities are less than one, therefore they are said to be inelastic in nature. The estimated health care expenditure elasticities with respect to DURATION is 0.47, VISIT is 0.84, and DISTANCE is 0.30. In other words a 10 percent rise in the DURATION, VISIT, and DISTANCE would raise the health care expenditure by around 5 per cent. 8 per cent, and 3 per cent respectively. Comparing these elasticities, we find that health care expenditure elasticity with respect to VISIT is larger than any of the other elasticities. This means for the urban population of Banswara district as in the case for the rural population VISIT is more important in explaining the health care expenditure than other variables.

Dungarpur Rural: The results of the linear model show that three variables (X4, X6, and X8) have emerged out statistically significant at normal level of test significance, The positive sign on the variables X4 (DURATION) and X6 (DISTANCE) explain the increase in duration of illness episode and distance of source of care from residence increase the expenditure of the rural population of Dungarpur district. In the rural areas the health care facilities are not available at a reasonable distance, the contact with source of health care is postponed till it becomes unavoidable. Hence, people in rural areas incur more amount because of longer duration of illness and on travel. The negative sign on the variable X8 (ROOM) reveals that the increase in number of rooms in the household i.e. increase in the socio-economic status of the family decreases the expenditure on health care in the rural areas of Dungarpur district. It might be because, economically better placed households spend more on good health habits and also take early care of the ill person, therefore the expenditure on illness gets decreased.

Also, log-linear functional form, regression with four variables (X4, X5, X6, and X 10) is statistically significant at normal level of test significance. The positive coefficients of the variable X4 (DURATION), X5 (VISIT) and X6 (DISTANCE) go to suggest that all these variables are important in explaining the increased expenditure incurred by the rural population. Duration of illness episode, distance travelled to health care facility and number of times such distances are covered, go to determine the total expenditure on health care. This contributes to explanation of higher amount incurred on health care by the rural persons only due to non availability of health care facilities at reasonable distance. Finally, positive sign on the variable X10 (EDUM) may appear to be bit surprising. But this result indicates that education influences the perception of illness and therefore expensive health care provider (private sector) is preferred for the treatment of the sick member in the family.

The coefficients of the log-linear function depict the elasticity of health care expenditure with respect to explanatory variables. The estimated health care expenditure elasticities with respect to DURATION is 0.4. VISIT is 0.36, DISTANCE is 0.52 and EDUM is 0.70. In other words, a 10 percent rise in the DURATION, VISIT, DISTANCE and EDUM would raise the health care expenditure by around 5 per cent, 4 per cent, 5 per cent and 7 per cent respectively. The estimated elasticities are less than one,

therefore these are inelastic in nature. This suggest that rise (fall) in these variables increase (decrease) the total expenditure. It is thus observed that health care elasticity with respect to EDUM is larger than any other elasticity. This result reveals that EDUM is more important than other variables in explaining health care expenditure in the rural areas of Dungarpur district.

Dungarpur Urban: The linear estimation shows six variables (X2, X4, X6, X7, X9 and X 11) are statistically significant at normal level of test significance. The positive sign on variables X4 (DURATION). X6 (DISTANCE), X9 (FAMILYSIZE) and XI 1 (EDUF) indicate that duration of illness, distance of health care facility from the residence and family size of the sick person tend to increase the health care expenditure of the urban families. It is probably because in the urban areas of the Dungarpur district, people are more willing to seek good quality care and also have good paying capacity for health care. The quality care might not be available at a reasonable distance and people spend good amount on travel expenses to get quality health care. Moreover, individuals living in the larger family may be persuaded by family members to get health care and it indirectly increases the willingness to seek health care and therefore the expenditure increases. Finally, better educated females in the household may lead to a better appreciation of the desirability of seeking good quality health care, which increases the total expenditure on health care. The negative sign on the variables X2 (EDU) and X7 (INCOME) suggest that education of the sick person and income of the household tend to decrease the expenditure on health care of the urban families. It is probably because the educated person takes early care for the illness which reduces the total expenditure on the treatment. On the other hand, the high income households spend more on good health habits and also takes early care of the ill person, therefore the total expenditure on health care comes down.

In case of logarithmic model, regression with three variables (X4, X5, and X6) is statistically significant at normal level of test significance with positive sign. The positive nature of the variables X4 (DURATION), X5 (VISIT) and X6 (DISTANCE) provide the empirical evidence that duration of illness episode, visits to source of care and distance of source of care from the residence of the sick person are important determinants of the expenditure that is incurred by the urban families of the Dungarpur district. It is probably because in the urban areas of the Dungarpur district, people have high willingness to seek good quality care and also have good paying capacity for health care. The quality care might not available at a reasonable distance and people spend good amount on travel expenses to get quality health care.

All the coefficients of the log-linear function also depict the elasticity of health care expenditure with respect to explanatory variables. The estimated elasticities coefficients are less than one; these are therefore said to be inelastic in nature. Among the three elasticity coefficients for the urban areas of Dungarpur district, health care expenditure elasticity with respect to VISIT is larger (0.64) than any other elasticity. In other words,

100 per cent rise in visits would raise the expenditure around 64 per cent. This indicates that for urban families of Dungarpur district VISIT is more important than other variables. This once again provides the evidence that more (less) number of visits to the sources of health care increases (decreases) the expenditure on health care of urban families

Udaipur Rural: The results of linear estimation show the regression with 5 variables (XI, X4, X5, X6, and X7) is statistically significant at normal level of test significance. The positive signs on the XI (AGE), X4 (DURATION), X5 (VISIT), and X6 (DISTANCE) variables prove that age of the sick person, duration of illness episode, number of visits to the source of care and distance travelled to contact the source of care from the residence of the sick person directly effects the expenditure on health care of the rural families of Udaipur district. Their increase (decrease) makes the changes in the expenditure on health care in the same directions. This type of empirical evidence, supports the explanation of lesser attention to the sickness of the aged persons in the initial stages of illness and hence increase in the duration of illness episode culminating into more visits to the health care providers. Empirical evidence also supports the view that rural areas have lesser number of health care facilities and therefore rural families incur larger amount on the travel to reach the required health care facility. The significant negative sign on the variable X7 (INCOME) suggests that the high income group households spend less on health care in the rural areas of Udaipur district. It could be because, the high-income households spend more on good health habits and also take early care of the sick family member. Such actions bring *down* the expenditure on health care.

Logarthmic regression with four variables (XI, X4, X5, and X6) is statistically significant at normal level of test significance with positive sign. The positive nature of the coefficients of the variable XI (AGE), X4 (DURATION), X5 (VISIT) and X6 (DISTANCE) indicate their importance in the expenditure made on health of sick persons by the rural families of Udaipur district. Same were the results in case of linear function. There is, therefore, convincing evidence to believe that increased age of the sick person, longer duration of episode of illness, more visits and longer distance of health care facility increase the expenditure of rural families of Udaipur district.

All the elasticity coefficients of health care expenditure with respect to explanatory variables are inelastic in nature. Comparing the four coefficients of elasticities, we find that health care expenditure elasticity with respect to AGE is 0.27, DURATION is 0.41 VISIT is 0.62 and DISTANCE is 0.28. The expenditure elasticity with respect to visit *is* larger than other three elasticities. This indicates that for rural families of Udaipur district VISIT is more important than other variables. This once again provides the evidence that more (less) number of visits to the sources of health care increases (decreases) the expenditure on health care of rural families.

Udaipur Urban: Four variables (X3, X4, X6, and X9) emerged out to be

statistically significant in the linear functions. Of these four explanatory variables only X3 (TIMEGAP) turns out to be negative in nature; suggesting thereby that the increased time lag duration between the onset of the disease and contact with the source of care reduces the total expenditure on health care of the urban families. In other words, non-seriousness towards one's sickness or reporting to the health care provider only when desired cure becomes unavoidable (which infact is the general habit of the urban persons) reduces the total expenditure on health care. Positive sign on the variables X4 (DURATION) and X6 (DISTANCE) was also obtained in case of both the functions of the Banswara and Dungarpur districts. Hence there is enough evidence to say that duration of the illness episode and distance go to determine the expenditure on health care by the rural and urban families of the three districts. The positive sign on the variable X9 (FAMILYSIZE) reveals that the increase in the size of family i.e. number of persons in the household increases the expenditure on health care in the urban areas of Udaipur district. It might be because of individuals living in the larger family persuaded by family members to get health care and it indirectly increases the willingness to seek health care and therefore the expenditure increases.

Only four variables (X4, X5, X6, and X7) are found to be statistically significant in log model. The positive nature of the coefficients of the four variables, namely, X4 (DURATION), X5 (VISIT), X6 (DISTANCE) and X7 (INCOME) proves once again that duration of illness episode, number of visits, distance of health care facility and income are important determinant in the total expenditure incurred by the urban families of Udaipur district. In fact income coefficient was negative in case of urban families of Dungarpur district. Reason here could be that high income group families of urban Udaipur spend more on the health care whenever their family member falls sick.

The coefficients of the log-linear function depict the elasticity of health care expenditure with respect to explanatory variables. All the elasticity coefficients are less than one hence the health care expenditure is said to be inelastic in nature with respect to these variables. Comparing the four elasticities, we find that health care expenditure elasticity with respect to INCOME is larger (0.68) than to DURATION (0.44). VISIT (0.43), DISTANCE (0.28) any of the other elasticities. This result explains that INCOME is more important determinant in the health care expenditure than other variables in this area.

Regional Level Models

TSP Region Rural: Three variables (X2, X4, and X6) are found to be statistically significant at normal level of test significance in the linear estimation. The goodness of fit measures R-Sq. and Adj.R-Sq, are 0.56 and 0.54 respectively. The positive sign on the all these three variables X2 (EDU), X4 (DURATION) and X6 (DISTANCE) indicate their direct relation with the expenditure on health care. In other words, for the rural families of the TSP region education of the sick person, duration of illness episode,

distance travelled to contact the source of care from the residence of the sick person are the basic determinant in the health care expenditure. This supports the generally held view that in the rural areas of the TSP region the non availability of the health care facility forces the families of the sick person to avoid contact with the health care provider till the cure becomes totally unavoidable. Hence it takes longer duration to cure the sick person. Both these factors go to increase the expenditure to be incurred on health care of the sick person by the families.

In the estimates of the log-linear functional form, six variables (XI, X3, X4, X5, X6 and XI 0) are found to be statistically significant at normal level of test significance. Except one variable X3 (TIMEGAP), which has negative sign, all the remaining obtain positive sign. The negative sign suggest the view that rural families being poor and illiterate, avoid to contact with health care provide (for the poverty and availability of doctor at distance places) till it is absolutely essential for the sick person. This tends to increase the time gap between the onset of disease and contact with the source of care. This decreases the expenditure on health care. But at times this 'long gap' can entail longer duration of cure which increases the expenditure. This is evident from positive sign on the X4 (DURATION), X5 (VISIT), and X6 (DISTANCE) variables. That is to say, due to poverty, families delay contact with the source of health care but have to ultimate incur more expenditure due to more visits to the longer distances and of extended duration of the illness of the patient.

The estimated expenditures elasticities with respect to significant explanatory variables AGE (0.19), TIMEGAPE (-0.09), DURATION (0.52), VISIT (0.57), DISTANCE (0.39). EDUM (0.26) are inelastic in nature. On comparing the estimated elasticities for the rural areas of the TSP region, it is observed that health care expenditure elasticity with respect to VISIT is larger than any other elasticity. It suggests that VISIT is more important to explain the variations in expenditure on health care. Increase (decrease) in the number of visits to health care facility increases (decreases) the expenditure on health care. A 100 per cent increase in VISIT, would increase the expenditure on health care by 57 per cent.

TSP Region Urban: Seven coefficients of the variables (XI, X2, X3, X4, X6, X9, and X 11) statistically significant in the linear expenditure model for the urban areas of the whole TSP region. The goodness of fit measure R-Sq. = 64% and Adj.R-Sq = 63%. Except for the two variables X2 (EDU) and X3 (TIMEGAP) all the remaining five variables XI (AGE). X4 (DURATION), X6 (DISTANCE) and X9 (FAMILYSIZE) are positive in nature indicating direct relation with the dependent variable of expenditure. The negative sign on EDU and TIMEGAP reveal that literacy of sick person does not make a favourable change in the expenditure, while the time gap between onset of disease and reporting to health care provider increase the expenditure of the families in urban areas of the TSP region.

The coefficients of four variables (X4. X5, X6 and X7) are statistically significant

in case of log-linear model for the urban areas of the TSP region. The estimated health care expenditures elasticities with respect to explanatory variables are [DURATION (0.48). VISIT (0.89), DISTANCE (0.34), and INCOME (0.28)] found to be inelastic in nature and the elasticity with respect to VISIT is the largest. Thus as in case of urban areas of the TSP region the health care expenditure of the urban families is more influenced by VISIT than any other variable. This result reveals that more (less) visits to source of care increases (decreases) the expenditure of the urban families.

A Comparative Analysis

In case of the rural areas of Banswara district it is observed that the explanatory variables; X 1 (AGE), X3 (TIMEGAP), X4 (DURATION), X5 (VISIT), X6 (DISTANCE), X8 (ROOM) and X9 (FAMILYSIZE) have emerged as statistically significant, while in case of urban areas; XI (AGE), X4 (DURATION), X5 (VISIT), X6 (DISTANCE), X10 (EDUM) and X 11 (EDUF) are statistically significant. Therefore, it could be concluded that the variables representing the physiological needs, perception of needs, willingness to meet felt needs by securing health care and ability to secure health care are important factors in deciding the health care expenditure in the rural and urban areas of Banswara district. In case of the rural areas of Dungarpur district the explanatory variables; X4 (DURATION), X5 (VISIT), X6 (DISTANCE), X8 (ROOM) and X10 (EDUM) emerged as statistically significant. For the urban areas of the district the explanatory variables;
X2 (EDU), X4 (DURATION), X5 (VISIT). X6 (DISTANCE), X7 (INCOME), X9 (FAMILYSIZE) and Xll (EDUF) are statistically significant. Therefore, it is evident that perception of need, willingness to meet felt needs by securing health care and ability to secure health care determine of the demand for health care in the rural and urban areas of Dungarpur district. For the rural areas of Udaipur district it is observed that the explanatory variables; XI (AGE), X4 (DURATION), X5 (VISIT), X6 (DISTANCE), and X7 (INCOME) emerged statistically significant, and for the urban areas, X 1 (AGE), X3 (TIMEGAP), X4 (DURATION), X5 (VISIT), X6 (DISTANCE), and X7 (INCOME) emerged statistically significant.

So far as the existence of the various stages of the demand for health care is concerned, the analysis suggests that there is no divergence among districts between physiological needs and perception of needs. Willingness to meet felt needs by securing health care and ability to secure health care determine the demand for health care in the three districts of the TSP region. However, the level of existence of the four stages in the estimated demand functions is found to be not same. Health care expenditure due to existence of physiological needs and perception of illness is fully evident in the three districts and in the TSP region when taken as a whole. But, willingness to secure health care and ability to secure health care are not equally important in the estimated demand functions of the three districts and TSP region as a whole.

Log-linear demand functions provide health care expenditures elasticities with respect to explanatory variables. In all the demand functions these are inelastic in nature. In case of Banswara district, the estimated health care expenditure elasticities with respect to VISIT and DISTANCE are 0.91 and 0.47 for the rural sample, and 0.84 and 0.30 for the urban sample respectively. Although they are inelastic, rural households respond almost 7 per cent and 17 per cent higher to increased VISIT and DISTANCE than urban households. For the Dungarpur district, the estimated health care expenditure elasticities with respect to DISTANCE are 0.52 for the rural sample, and 0.43 for the urban sample. Therefore rural households respond almost 9 per cent higher to increased distance than urban households. Also, the rural households respond around 10 per cent higher to increased DURATION than the urban households. Similarly, the urban households respond almost 28 per cent higher to increased VISIT than rural households. For Udaipur district, the estimated health care expenditure elasticities with respect to VISIT are 0.62 for the rural sample, and 0.43 for the urban sample. In other words, rural households respond almost 19 per cent higher to increased VISIT than urban households. Also, urban households respond almost 23 per cent higher to increased DURATION than rural households. Similarly, for the TSP region as a whole urban households respond almost 32 per cent higher to increased VISIT than rural households. Further, the rural households for the TSP region as a whole respond only 4 per cent and 5 per cent to increased DURATION and DISTANCE than urban households respectively. Therefore VISIT is more important in the TSP urban areas as a whole, while DISTANCE and DURATION are more important in explaining the expenditure on health care in the TSP region as a whole in rural areas.

Conclusions and Policy Implications

An attempt has been made in this paper to assess the impact of different variables on the expenditure on health care at the household level. This has prodded a better insight

into the reasons for variations in the demand for health care in terms of expenditure incurred on it. A theoretical model for demand for health care has been formulated which consisted of the four successive stages, namely physiological needs, perception of needs, willingness to meet felt needs by securing health care, and ability to secure health care. In the estimated demand model health care expenditure is considered as the dependent variable (since it reflect the quantity and quality of health care demanded) and a total of 11 variables are considered as explanatory variables which reflects the demand for health care. So far as the existence of the four stages of the demand for health care is concerned, there is no divergence among all the study districts. However, the level of existence of the four stages in the estimated demand functions are not found similar. The three variables namely, duration of illness episode, number of visits to source of care during reference period and distance of source of care from residence of the

household are important in explaining the increased expenditure on health care in the rural and urban areas of the TSP region as a whole, as well as in case of each of the study district. The study explains that the available health care facilities are not able to meet the expectations of the people hence people have to travel long distances to get the desired health care in the TSP area. It is also evident from the study that the duration of illness episode is important enough in influencing the health care expenditure and due to this the more number of visits are required. Therefore, it is proposed for the TSP region, that to increase in the demand for health care, efforts should be made to reduce the duration of illness episode, distances travelled by the patient, and also the number of visits to health care providers. All these efforts may be possible through delivery of better quality services, increased out-reach of services and effective health education. It may lead to improved health status at lower expenditure.

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References

Abu-Zeid, H. A. and Dann, W. M., 1985, Health Services Utilisation and Cost in Ismailia, Egypt. *Social Science and Medicine,* 21(4). Amin, R., Chowdhury, S. A., Kamal, G. M. and Chowdhury, J., 1989, Community Health Services and Health Care Utilisation in Rural Bangladesh. *Social Science and Medicine,* 29(12). Basu, A. (1983). Socio-Demographic Determinants of Health Implications for Health Care Policy in America. *Population Review,* 27(1-2). Duggal, R. and Amin, S., 1989, *Cost of Health Care: A Household Survey in an Indian District.* Bombay: Foundation for Research in Community Health. Ellis, R-R, Mcinnes, D. K. and Stephenson, E. H., 1994, Inpatient and Outpatient Health Care Demand in Cairo, Egypt. *Health Economics,* 3.

Marin, B. V., Marin, G., Padilla, A. M., Rocha, C. de la, and Fay, J., 1989, Health Care Utilisation by Low-Income Clients of a Community Clinic. An Archival Study. *Hispanic Journal of Behavioral Sciences,* 3(3). Sack, R. A., 1980, The Effects of Utilisation on Health Care Costs. *American Journal of Obstetrics and Gyneocology,* 15 137(2). Sodani, P. R., 1997, An Econometric Analysis of Health Care in Rajasthan: With Special Reference to TSP Region of the State. *Doctoral Thesis,* Mohan Lal Sukhadia University, Udaipur.

DETERMINANTS OF DEMAND FOR HEALTH CARE: LINEAR ESTIMATES

Explanatory Variable	*Banswara*		*Dungarpur*		*Udaipur*		*TSP Region*		
	Rural	*Urban*	*Rural*	*Urban*	*Rural*	*Urban*	*Rural*	*Urban*	*Total*
INTERCEPT	91.25	177.69	114.45	1046.09	- 947.71	227.27	- 697.20	- 955.02	- 886.51
XI: AGE	- 1.50	4.23**	- 2.41	14.34	11.92*	3.16	2.61	11.93***	5.74
X2: EDU	7.79	40.05	329.94	- 478.32**	124.41	- 45.80	162.84*	- 150.18***	1.01
X3 TIMEGAP	- 40.17***	- 2.57	27.67	- 42.71	5.45	- 29.54***	7.36	- 60.59**	- 3.44
X4 DURATION	24.82***	6.98	29.07***	44.84***	20.86***	27.77***	26.24***	39.51***	28.62***
X5 VISIT	- 52.96	83.91***	- 98.11	70.73	70.05**	5.16	48.30	27.84	56.91**
X6 DISTANCE	23.45***	5.53***	17.51***	10.65***	16.17***	8.16***	15.50***	10.52***	13.58***
X7 INCOME	0.03	- 0.004	0.005	- 0.13**	- 0.18**	0.04	- 0.01	- 0.04	- 0.02
X8 ROOMS	95.23*	13.29	- 427.68**	46.42	- 17.79	- 35.78	- 97.74	- 10.07	- 46.83
X9 FAMILYSIZE	- 40.21**	15.49	- 38.94	229.01**	70.91	56.36*	49.30	17.10**	- 23.99
X10: EDUM	3.32	- 138.98**	137.28	- 388.79	- 17.88	- 162.01	- 6.43	- 17.10	- 23.99
X11:EDUF	38.94	15.01	87.54	776.82***	32.62	66.64	14.38	119.48**	132.20**
N (No. of Obs.)	99	88	107	114	149	93	355	295	650
R-Square	0.801	0.501	0.557	0.516	0.549	0.695	0.558	0.639	0.661
Adj. R-Square	0.776	0.430	0.528	0.464	0.514	6.654	0.544	0.625	0.655
F-Value	31	7	11	9	15	16	39	45	113
SEE	353	370	2396	2166	1283	498	1571	0.96	0.92

* Denotes significant at 0.10 level

** Denotes significant at 0.05 level

APPENDIX-II

DETERMINANTS OF DEMAND FOR HEALTH CARE: LOG LINEAR ESTIMATES

Explanatory Variable	*Banswara*		*Dungarpur*		*Udaipur*		*TSP Region*		
	Rural	*Urban*	*Rural*	*Urban*	*Rural*	*Urban*	*Rural*	*Urban*	*Total*
INTERCEPT	1.59	2.43	2.20	2.19	2.34	0.57	2.44	1.50	1.92
X1 AGE	0.21***	0.15	– 0.01	0.01	0.27***	– 0.13	0.19***	0.02	0.11***
X2 EDU	0.12	0.30	– 0.09	– 0.03	0.003	– 0.12	0.03	0.01	0.02
X3 TIMEGAP	– 0.17*	0.10	– 0.14	– 0.08	0.04	0.12	– 0.09*	0.01	0.07
X4 DURATION	0.15	0.47**	0.47***	0.37**	0.41***	0.44***	0.52***	0.48***	0.52***
X5 VISIT	0.91***	0.84***	0.36**	0.64***	0.52***	0.43*	0.57***	0.89***	0.63***
X6 DISTANCE	0.47***	0.30***	0.52***	0.43***	0.28***	0.28***	0.39***	0.34***	0.38***
X7 INCOME	0.15	0.07	0.13	0.06	0.12	0.68**	– 0.01	0.28**	0.09
X8 ROOMS	0.07	0.27	– 0.21	0.22	– 0.01	– 0.279	0.11	0.002	0.01
X9 FAMILYSIZE	0.05	0.47	– 0.21	0.15	– 0.08	– 0.974	0.07	0.06	0.09
X10: EDUM	– 0.003	– 0.70	0.70**	– 0.01	0.06	– 0.974	0.26**	– 0.36	0.20*
X11:EDUF	– 0.04	– 0.46**	0.13	0.35	0.07	0.072	– 0.01	– 0.10	0.003
N (No. of Obs.)	99	88	107	114	149	93	355	295	650
R-Square	0.636	0.560	0.695	0.755	0.681	0.622	0.681	0.639	0.661
Adj. R-Square	0.590	0.497	0.659	0.729	0.656	0.571	0.671	0.625	0.655
F-Value	13	8	19	28	26	12	66	45	113
SEE	0.73	1	1	0.90	0.71	– .93	0.88	0.96	0.92

* Denotes significant at 0.10 level
** Denotes significant at 0.05 level
*** Denotes significant at 0.01 level
*** Denotes significant at 0.01 levela