CHOICE BASED ON ACCESSIBILITY & SOCIAL DETERMINANTS – A CASE OF ELDERLY HEALTH CARE DECISION AND HEALTH TRIPS IN INDIA

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SUMMARY

Improving the health of the elderly, particularly of those living in the rural areas of India, requires a systematic and integrated approach. Government hospitals in India provide treatment at a nominal rate to all and with free services for poor and senior citizens. However, there is a noticeable difference in the quality as we move from urban to the rural areas. Nevertheless, in case of illness, it was found the elderly chooses from four options, which the study considers as a decision making behavior of the person. Lack of medical insurance, differential socio-economic classes, attitude and self-belief are the endogenous determinants whereas travel impedance, long waiting time, unavailability of service being the exogenous constraints. The main objectives of this study are to study the causal factors that persuade people to choose different services in order to fulfill the needs and to review the impact of accessibility impedance on healthcare choice behavior of elderly.

The unit level survey of NSSO on “Morbidity and Health care” was selected for the study. The analysis was further carried on with the travel behavior of the ill elderly to the appropriate health center based on the unit level survey of NSSO on “Domestic Tourism Survey”; the travel behavior is subdivided as “same day” and “overnight” trips.

Accessibility impedance and quality of health care as in many cases, plays the critical role in case of the elderly. It becomes prudent for the policy makers to consider the health seeking behavior and shift the focus from increasing the number of health centers to quality assessment and integration of current plural system of health service as well.

Key words: Rural elderly; healthcare decision; accessibility impedance; SEM
1. INTRODUCTION

Choice of Health care facility in developing countries is a complex issue. There are several intricate factors, governed by diverse socio-physical determinants. Access to PHC is not yet a well-defined concept. This results in ‘access’ encompassing meanings that range from the capacity to pay, clinic operation times, feeling you have the right, ability or interest to access services [Bernard et al., 2004], to the physical siting of PHC service sites [Tanser, 2006]. Access to the healthcare has also been defined on basis of the travel time considering the availability of own vehicle and public transportation especially for elderly [Izumiyama et al, 2007].

The goal of the national healthcare policy of India-Vision 2020, suggests “the universal access, access to an adequate level, and access without excessive burden”. This mirrors the idea of reducing the inequalities, specially the health inequalities affecting access and quality. The issue of equitable access is, however, complex. Talen (1998) argues that it includes a number of value judgments about which groups should benefit, what social justice looks like, and how to arrive at decisions about allocation of resources. Access to health care in general can be thought of in a number of ways, including based on geographic location, wait-list times, availability of needed information (e.g., for system navigation) and service quality [Torgerson et al., 2006]. According to [Haggerty et al., 2007], first-contact accessibility in PHC pertains to ‘the ease with which a person can obtain needed care from the practitioner of choice within a time frame appropriate to the urgency of the problem’.

The public service providers are inexpensive but are overburdened [Shiva Kumar et al., 2011] leading to extremities in high waiting time and underutilization [World Bank, 2002] due to poor quality. Under these circumstances, the probability of referral from the PHCs to other higher LOS is high, this results in two consequences; firstly people have to travel longer distances and secondly, they need companions. The elderly, sometimes with their limited mobility, becomes fully dependent on companions to take them to the healthcare units. However, the setting becomes complex with the interplay of several other intrinsic constraints. The differential socio economic settings, education, economic dependency and physical constraints generate several types of choice behaviors which are also affected by peoples’ belief and attitude. The Socio demographic factors, social group structure, knowledge about disease are significantly related to the individual’s medical orientation. [Wirick, 1966] argued that individual’s resource is most significant for demand of healthcare. Transportation availability, costs and facility characteristics also interacts with distance in affecting people’s use of healthcare [Joseph et al, 1984]. The disaggregated level analysis of the people’s behavior when they fall sick reveals that in a given period of illness, the patient makes healthcare decision in stages [Christianson J B. 1976]. The household characteristics often moderate activity demand, it influence activity decisions. The effects differ by household type, size, member relationships, age and gender, and
The study conducted by [Kloos et al, 1987] established that ambitious health infrastructure development program envisaged by the Government of Ethiopia faced implementation problem and the issues of accessibility remained as a critical concern. The role of the private sector remained a key issue of concern considering the service delivery expenses that one has to bear keeping in mind the socio economic diversity and question of equity. In this context, the following table enumerates the criticism of different key health service providers in India. Despite the policies and the efforts of the government and other agencies, the goal of health for all has remained elusive.

Accessibility to healthcare in India has always been reviewed at the aggregated level such as numbers of hospitals or primary health centers in given district or state and the reviews on the quality of the health care system have always been subjective and ambiguous. When the choice behavior is reviewed, the majority of the people chose private units, bypassing the nearest public units, in spite of it being expensive in most cases. Inability to develop and integrate plural systems of medicine and assign practical roles to the private sector has triggered the people to switch between the following; weak public systems, expensive private provisions or at the limit forego care entirely except life threatening situations, in such cases slide into indebt. [Rao et al, 2011]

The objectives of this study are (1) to study the causal factors that persuade people to choose different services in order to fulfill the needs and (2) to review the impact of accessibility impedance on healthcare choice behavior of elderly.

2. DATA

The analysis is based on the Sample survey conducted by National Sample Survey Organization (NSSO), Government of India. The unit level survey of NSSO on “Morbidity and Health care 2004” (Number of selected samples - 985) and “Domestic Tourism Survey 2010” (Number of selected samples – 2,857) were chosen for the study. The case of West Bengal, India was selected for the current study.

2.1 PRELIMINARY ANALYSIS

The dataset on “Morbidity and Health care 2004” were preliminarily segregated on basis of age of the person (age≥60) who attained medical attention in last 15 days from the day of survey. The segregated data was then segmented based on three criteria. Firstly, based on the locational parameter such as rural or urban, secondly, the socio economic criteria such as urban have-nots, urban others, rural have-nots and rural others. The definition of each of these has been intended on basis of the occupation, cooking fuel used, typology of houses, and expenditure pattern of each
case household. Thirdly, on basis of the disease typology, such as long term and short term illness.

The preliminary analysis of the dataset on ‘Morbidity and Healthcare 2004’ reveals that there are four options that elderly selects from. Figure 1, shows the revealed choice of respondents in the rural areas of West Bengal. The bar chart shows that private facilities are mostly chosen by the elderly, except in case of the rural have-nots, where cost of health service is a constraint, the constraint may also have played a role for the opting ‘do-nothing’.

![Figure 1: Revealed choice of elderly in rural West Bengal, India](image)

The dataset of “Domestic Tourism Survey 2010” was firstly segregated for the elderly (age≥60) and then segmented on basis of the tour type, namely, same day and overnight. The cross tabulation analysis revealed that overnight trips mostly occur due to the unavailability of health infrastructure in the neighborhood; however, it is contextual to know that there is significant number of people who had to undergo overnight trips even when the destination is in the same district. The lack of appropriate travel infrastructure especially operation hours of transportation system often forces people for overnight trips. Companionship is observed in most of these tours. The number of companions is more in case of overnight tours than same day tours. The analysis also indicated that in overnight tours, the numbers of companions tend to increase if number of places visited is more than one.

3. METHODOLOGY

Taking indications from the preliminary analysis, it seems to be prudent to comprehend the determinants that influence people to choose, consequently generating travel demand and hence the trip types. The dataset on “Morbidity and Health care 2004” was considered for intrinsic analysis. The datasets were prepared in SPSS (ver.19) and the database was carefully prepared to remove missing data. Two separate models were constructed to analyze the causal relationships. The models were developed in AMOS (ver. 19)

To attain the objective of apprehending the causal factors of the choice of the different typology of health centers, structure equation models (SEM) were constructed. There are substantial advantages of using SEM over other multiple
regression methodologies. Firstly, SEM estimates all the coefficients in the model simultaneously, thus it becomes easier to assess the significance and strength of a particular relationship in context of the whole model. Secondly, SEM can handle hierarchical regression. Thirdly, multi co-linearity can be modeled and thus assessed. The mentioned advantages seem to be effective in interpreting the choice behavior specially which are complex in nature involving several observed and unobserved constraints.

Model calibrations were performed by the maximum likelihood (ML) method. The initial model consists of 16 observed variables and a latent endogenous variable. Table 2, shows the list of all the variables and their respective descriptions. Table 3, shows the calibration results for the modified models. The results present the calibrated parameters together with their T statistics at 95% level of significance. The models fit well with respect to the generally accepted measures of goodness of fit.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility Impedance</td>
<td>A latent variable, constructed to incorporate the effects of the observed variables such as Avg. Distance, unavailability, Facility_far, &amp; Others</td>
</tr>
<tr>
<td>Avg. Distance</td>
<td>This is the calculated crow flying distance that people have to travel to the Govt. Health Center, assuming that (1) all the centers are spread evenly (2) The catchment area is considered as circle.</td>
</tr>
<tr>
<td>unavailability</td>
<td>1, if health facility is unavailable in the neighborhood; else 0</td>
</tr>
<tr>
<td>Facility_far</td>
<td>1, if public health facility is far or distant; else 0</td>
</tr>
<tr>
<td>Others</td>
<td>1, other reasons that causes impedance to the choice of health service; else 0</td>
</tr>
</tbody>
</table>

Table 1: List and descriptions of variables used in the model

3.1 Final Models

The conceptual model was designed to analyze the effect of accessibility impedance on the choice behaviors. The accessibility impedance is the latent variable that has been constructed based on the variables such as average distance of health centers, whether the facility is far, whether the facility is unavailable in the neighborhood and ‘others’. The observed indicators had t-value significant which explains how well the observed variables explain the construct. The baseline model was designed to examine the causal effects of various endogenous characteristics, mobility problem of the elderly, the characteristics of the health care units and the perception of the disease and health care units on the choice behaviors as well as to examine how the mentioned parameters interact with each other. The model tried to capture the role of several physical and social determinants on the health care center choice behavior for rural elderly on two different socio economic classes namely the rural have-nots and rural others.
Figure 2: Model A Rural Elderly Have-nots - Direct effects

Figure 2 and 3 describes the simplified model structure depicting the significant causal effects on the choice options. Table 2 and 3, describes the total effects of all the observed endogenous variables on the choice options for the rural have-nots and others.

<table>
<thead>
<tr>
<th>Affected Variables</th>
<th>Accessibility Impedance to public hospital#</th>
<th>Mobility Problem</th>
<th>If male</th>
<th>HH size</th>
<th>Delay in Public HC – Long waiting time</th>
<th>Previous Exp. Dissatisfaction from public HC</th>
<th>Attitude - Lack of faith</th>
<th>Self-belief – not considered serious</th>
<th>If married</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay in Public HC – Long waiting time</td>
<td>-0.102</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous Exp. Dissatisfaction from public HC</td>
<td>-0.276</td>
<td>0.069</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude - Lack of faith</td>
<td>-0.006</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-belief – not considered serious</td>
<td>-0.135</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choice - Public</td>
<td>-0.362</td>
<td>-0.131</td>
<td>-0.035</td>
<td>0.084</td>
<td>-0.163</td>
<td>-0.355</td>
<td>-0.148</td>
<td>-0.201</td>
<td>-0.184</td>
</tr>
<tr>
<td>Choice - Private</td>
<td>0.546</td>
<td>0.053</td>
<td>-0.048</td>
<td>-0.049</td>
<td>0.284</td>
<td>0.689</td>
<td>-0.004</td>
<td>0.027</td>
<td>0.031</td>
</tr>
<tr>
<td>Choice - Self Medication</td>
<td>0.179</td>
<td>-0.032</td>
<td>0.131</td>
<td>0.181</td>
<td>-0.051</td>
<td>-0.107</td>
<td>0.093</td>
<td>-0.009</td>
<td></td>
</tr>
<tr>
<td>Choice - To do nothing</td>
<td>-0.165</td>
<td>0.033</td>
<td>0.097</td>
<td>-0.104</td>
<td>-0.037</td>
<td>2.009</td>
<td>0.152</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Total effects given in standardized coefficients (Model A: Rural Elderly Have-nots)
Figure 3: Model B Rural Elderly Others - Direct effects

<table>
<thead>
<tr>
<th>Affected Variables</th>
<th>Accessibility Impedance to public hospital</th>
<th>Mobility Problem</th>
<th>If male</th>
<th>HH size</th>
<th>Delay in Public HC - Long waiting time</th>
<th>Previous Exp. Dissatisfaction from public HC</th>
<th>Attitude - Lack of faith</th>
<th>Self-belief - not considered serious</th>
<th>If married</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay in Public HC - Long waiting time</td>
<td>-0.263</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous Exp. Dissatisfaction from public HC</td>
<td>-0.465</td>
<td>0.112</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude - Lack of faith</td>
<td>-0.157</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-belief - not considered serious</td>
<td>-0.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choice - Public</td>
<td>-0.359</td>
<td>-0.097</td>
<td>-0.009</td>
<td>0.004</td>
<td>-0.729</td>
<td>-1.053</td>
<td>-0.378</td>
<td>-0.695</td>
<td>0.019</td>
</tr>
<tr>
<td>Choice - Private</td>
<td>0.238</td>
<td>0.089</td>
<td>0.226</td>
<td>0.002</td>
<td>0.385</td>
<td>0.839</td>
<td>0.017</td>
<td>0.032</td>
<td>0.082</td>
</tr>
<tr>
<td>Choice - Self Medication</td>
<td>0.143</td>
<td>0.058</td>
<td>-0.098</td>
<td>0.041</td>
<td>-0.035</td>
<td>-0.223</td>
<td>-0.062</td>
<td></td>
<td>0.008</td>
</tr>
<tr>
<td>Choice - To do nothing</td>
<td>-0.008</td>
<td>-0.081</td>
<td>-0.105</td>
<td>-0.097</td>
<td>0.079</td>
<td>1.387</td>
<td></td>
<td>-0.153</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Total effects given in standardized coefficients (Model B: Rural Elderly Others)
4. DISCUSSION

The study tests the hypothesis that “High Accessibility impedance (distance, unavailability, price etc.) and low quality of health service (previous experience, long queues etc.) have a snowball effect on the elderly, which leaves them with the option of ‘self-medication’ & ‘to do nothing’. In the current context where a huge out-migration of young population is observed to the urban areas in search of better lifestyle, should deteriorate the current living status of the elderly irrespective of economic affluence. The model depicts that such is not the case. Instead, accessibility impedance and choice of doing nothing is negatively related and significant. Although out-migration is evident in current context, however, inter and intra household collaboration is becoming strong influencing phenomenon to tackle such problems. Elderly and their household collaborate to undertake same-day and overnight health tours. However the current study does not test the hypothesis of interpersonal collaboration or type of trips elderly undertake. In order to tackle the economic burden, the economically weaker elderly or their families usually take loans and fall in debts.

Qualitative variables such as attitude of the people and self-belief “not considered serious” has been considered as a causal variables which induces choice. The physical attributes such as location, distance, availability of service of the facilities and undefined impedance factor ‘others’ has been considered as the cause of ‘accessibility impedance’. The accessibility impedance played a vital role in the selection process of service provider. The lower quality of public facilities often triggers the choice of expensive private facilities. However, ‘accessibility impedance’ might not trigger the choice of self-medication or ‘do-nothing’. The previous experience of public service was critical. The unsatisfied patients tried to explore other alternatives in search of better service and hence satisfaction. The variable ‘Attitude’ explains whether the patient’s belief that “medicine can cure them or not”. The variable in the model explains a negative relationship with respect to the choice to deciding to visit any destination or not, this is significant in case of the choice of the public service. Long waiting time in the public facilities has a negative impact on the choice of public facilities and encourages people with the alternate choices.

The phenomenon of ‘do-nothing’ is rather difficult to explain with the current explanatory variables. In case of rural others, attitude seems to be the only significant parameter on the other hand lesser no of household size triggers the choice. It clearly shows that there is a need to introspect other parameters such as the economic effects of absence in job, the ability to reschedule the mandatory activity, need of the companions, the time schedule of the mandatory activity, and the mismatch of the operation hour of the facility with respect to the mandatory activity.

4.1 Comparative Analysis of the choices on basis of the socio economic segregation
Accessibility impedance had different effects on the different socio economic classes. On one hand it had negative impact on the choice of the public service and positive impact on the choice of private sources, for both classes, but on the other it did not necessarily triggers self-medication in rural other group, however in case of the have-nots, they chose to self-medicate themselves. This might be noted that in the study area, the density of private medical facilities is higher than that of the public facilities. Long waiting time in the public facilities reduced the probability of choosing the public facility in case of rural-others and sometimes elderly choose self-medication, however, in case of rural have-nots, the effect was rather mild although significant, but that necessarily did not triggers the choice of self-medication or ‘to do nothing’. Household size seemed to be an important parameter while an elderly selects public facilities. In case of rural-others even though household size did not seemed to be a significant causal variable, but for have-nots it played a vital role.

The model hinted towards the presence of companionship in such type of health related travels. The companionship might be essential due to two reasons, firstly due to lack of education in case of have-nots, to accompany during travelling and altruism during the long waiting time in the public facilities. The models explained that the effect of long waiting time although seemed to be significant for both classes however milder in case of rural have-nots. The elderly male in the ‘rural-other’ household did not usually choose to self-medicate, but the relationship was significant and negative in case of rural have-nots.

5. CONCLUSION

The current study revealed that in the event of falling ill, elderly reacts in three different stages. Firstly, the destination choice such as going to a government health center, private health center, self-medication and finally to do nothing. Secondly people undertake same-day or overnight tours to reach the facility of their choice. Thirdly, the choice of companions based on the previous stages. Dependency on the companions often has two fold impacts- delay of treatment for the elderly who had to wait and the impact of the trip on the companions who are sometimes forced to forego their mandatory activity.

The accessibility impedance seemed to be deterministic parameter in case of utilization of the public service especially for the aged irrespective of socioeconomic classes. Unavailability of certain services, unavailability of the public service as a whole, and lack of quality should not be considered as independent lacunas rather each one of these drawback affects the choice behavior identically and induces a tendencies of leap-frog to the highest level of service. This also shows the gap in the referral system. The weaker section of the rural India seems to suffer the most, economic constraints often reduces the possibility of usage of expensive opportunities available in the neighborhood. This throws light not only on the gap between the rhetoric and reality but also on the framework within which the policies have been formulated. The policy focus has been mostly on the development of the infrastructure especially the PHCs; however, this lacked the sense of integration and...
importance of strong referral system. The outline of the plan and their execution have been rather incremental than holistic. The methodology of reviewing the availability of Health Care units at an aggregated level such as in terms of numbers is inappropriate. The review methodology should be based on disaggregated analysis, incorporating locational, socio economic and transportation parameters coupled with the quality of service of the health units.

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