International Journal of Humanities and Social Science Invention
ISSN (Online): 2319 – 7722, ISSN (Print): 2319 – 7714
www.ijhssi.org ||Volume 6 Issue 1||January. 2017 || PP.58-66

An Analysis of Impact of Human Capital Investment on Demographic Characteristics of Human Resources: A Study of Chennai District, Tamil Nadu, India

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Abstract: *The demographic features of the 2011census of India have revealed that India is the second largest country next to China in terms of working age population (25 - 50 years) in the world. It has been known that the country's economic growth is based on both natural and human resources available in the country. Still, there are more avenues for effective and efficient use of labour-productivity in this age group. It is well conceived by the theory that the human resources are the biggest contributor of economic growth which is augmented by a process of human capital formation. Of late, health and education have been viewed as the two dimensions of human capital which are treated as an indicator of social welfare. The variations in health status of different age groups in market and non-market labour productivities are still prevalent in many developing countries. The low health status persons contribute less to human capital formation than of others (Behrman and Deolalikar, 1988). According to them, "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". Therefore, it cannot be purchased by the consumers in the market as we do for other goods and services in the market. On the other hand, it can be produced by spending time upon health improving activities, as well as, purchasing medical inputs (Grossman M., 1972).* ***Behrman*** *has pointed out that there is an inverse relationship between low health status and human capital formation. Therefore, the economists have focused their attention to study the determinants and impact of health status on economic growth. The present study attempts to analyse the human capital investment and its impact of socio- economic status on human resources (HR) in Chennai district, Tamil Nadu. To aid our research effort, an extensive literature has also been reviewed in an attempt to answer various queries raised. On the basis of the statement of problems, the research questionnaires have been canvassed among the respondents to obtain the information. This study is based on databases obtained both from primary and secondary sources. The information through primary sources has been collected with the help of interview schedule. The secondary data on Human Capital Investment and the Impact of Socio- Economic Status on Human Resources have been collected from various sources in Chennai City. In the health sector, this study focuses its attention to reporting illness, amount spent, days lost. Some of the opted econometric techniques have been used to examine the objectives of the study. Our empirical strategy has applied the following tools of analysis. The statistical tools like OLS, PROBIT and LOGIT techniques are used to analyze the indicator 'self-reported illnesses. And, 'Health expenditure' and 'number of days lost' are estimated by OLS and TOBIT techniques, besides by applying correlation, regression analysis.*

Keywords: *Capital, Well-being, resources, welfare and education.*

I. INTRODUCTION

The research in health care has recent origin within the context of economics itself. Health Economics is primarily concerned with the formal analysis of expenditure, benefits, management and consequences of health status and health care. In recent years, many economists have initiated their research in the field of health economics, particularly Human Capital Investment and the Impact of Socio- Economic Status on Human Resources. Health has been viewed as a dimension of human capital and treated as an indicator of social welfare of the people in all countries. Health cannot be purchased by the consumers in the market like other goods and services. However, it can be produced by them by spending time upon health improving activities and also purchasing medical inputs (**Grossman M.,** 1972a). The data discussed in the present study are based number of questions / statement of the problems raised. Some of the statements of the problems are:

What are the common health related problems of the people reported across in the study area? What are the factors that determine health status? Do these factors influence health status of males and females in the same way? If not, why? What are the demographic facilitations of the people in the study area? What are the impacts of its absences? Whether the choices of health care services influence the study area's macro indicators at comparable levels? How can the health of the poor be improved, and what are the economic consequences of better health? What are the policies that could improve the intra-household distribution of health outcomes?

In general, most of the health research has used life expectancy as one of the macro health indicators. However, for the measurement of health status, the micro indicators such as reporting **'illness',** number of **'days lost'** due to illness, '**health expenditure'** are all widely used. Duraisamy and Joseph Jeyapaul (1990) have used the similar approach to the problem using micro level data for Tamil Nadu.

II. NEED FOR THE STUDY

- ✓ As per the Demographic Census of India of 2011, it is claimed that India is the second largest country in terms of high working age group population. Since, the labour-productive efficiency is more in this age group; the government should explore the possibility of controlling morbidity in this age group.
- ✓ The economic growth in a country is based on both natural and human resources. The human resource and its efficient contribution to the economy are based on human capital formation. Health and Education have been viewed as two dimensions of human capital and treated as an indicator of social welfare of the people in all countries. The variations in health status of different age groups imply variations in their market and non-market labor productivities. Therefore, the effective contribution of the government to this sector through policy changes and proper implications are very much in need.
- ✓ Health facilities generally provide enhancement of the personal fitness of the individuals' thereby generating good work force. Sound work force develops the economy through efficient utilization of resources with their abilities and talents.
- ✓ The present study is indented to analyze the Impact of human capital investment on Demographic Characteristics of human resources in Chennai city in Tamil Nadu. In the health sector, the present study focuses to estimate common health problems, reporting illness, amount spent and days lost and choice of health care services.

III. OBJECTIVES OF THE STUDY

The present study has been conducted with the following objectives.

i. To analyze the impact of human capital investment to improve the skills on human resource
ii. To examine the determinants of self-reported health status indicators such as:

- ➢ reporting illness,
- ➢ number of days lost due to ill-health and
- ➢ amount spent to cure illness,

IV. LITERATURE REVIEW

Education has a wide range of direct and indirect benefits which instigate powerful changes in peoples' attitude to work. Education has positive impacts on the economy and so, investment in education and training is imperative if the aim is to propel the economy to higher level of productivity and income and thereby accelerate the rate of economic growth. In addition, education enhances their occupational mobility, reduces the level of unemployment in the economy, increases the earning capacity and productivity of the country's work force, improves access to health information which will increase life expectancy and, at the same time lower the fertility rate.

Health comes next to education in the development of human resources. There is symbiotic nexus between health and education. Education facilitates general enlightenment in the production of health as well as acquisition of the varied and much needed skills for the transformation of the society. So also, for the manpower and resources of a nation to be utilized to harness the other resources of a nation, the population must be healthy. Without good health, productivity is low and to ensure adequate productivity, the majority of the population needs to be protected from illnesses. A strong and healthy labour force is an essential factor in development.

According to **Yesufu** (2000), a good health policy is a means by which government can at once ensure that manpower is generated in the right mixes distributed in accordance with national priorities and ensure the highest level of labour productivity. Health improvement influences morbidity and labour force productivity. Thereby enhancing the process and speeding of economic development. Most of the developing countries have given serious attention to the provision of public health, education and social welfare services. This is because; it is believed that such measures could improve the quality of life of their people and their efficiency as productive agents thereby accelerating the general socio-economic development of their nation. Since health and education status affect the individual participation in economic activities and consequently the level of labour force in an economy, a re-examination of the level of investment in human capital and sustainable growth is highly imperative.

Health has long been considered as a fundamental commodity in economic analyses; **Michael Grossman** (2000) cites Bentham as recognizing that the 'relief of pain' is one of the basic arguments in the utility function. Moreover, Grossman (1972) argues that 'good health' is a commodity produced by the

individual. The commodity 'good health' is treated as part of his or her human capital, and as such it determines the total amount of time the individual can spend on productive activities in market and non-market sectors (Grossman, 1972 and 2000). Health was viewed both as an investment in human capital and as an output of a household production process by Grossman (1972a & b). In the Grossman model, health is both demanded for utility reasons - it is good to feel well - and for investment reasons – to make more healthy time available for market and non-market activities. The **Becker's** (1974, p. 1080) model predicts that in a household with a caring head, all other members are motivated to pursue a common goal. Thus, the subject health economics is so vast that it is not possible to survey the entire literature on health economics.

In general, health is defined as the desire of human being of longevity and illness free days. However, the demand for health is not a direct one, and therefore, it is very difficult to measure it. As a result, Grossman uses the Household Production Function Model of consumer behavior to build a theory of demand for health. In the economic theory of demand, the consumers have the choice of utility function, which makes them to order or rank alternative combinations of goods and services to be purchased in the market to maximize their level of satisfaction with their budget constraint. But, the demand for health is different from the demand for other goods and services. When consumers purchase medical services, they are not demanding those services in particular, but their intension is to demand better health. The demand for medical care and other health inputs are derived from the basic demand for health. The health production function can be expressed as:

$H_S = F(H_I)$,

Where,

H_S – Health Stock

H_I – Health Inputs

In Grossman model, the demand for health assumes that people have an initial stock of health, which depreciates with time or age but it would be improvised by health investment. This can be stated by the following equation:

$$\mathbf{H_{t+1} - H_t = I_t - \partial_t H_t}$$

Where

$H_{t+1} - H_t$ - Change in Health Stock

I_t - Gross Investment

$\partial_t H_t$ - Depreciation

i. When the marginal benefits (M_B) are equal to marginal costs (M_C), the individuals will be in optimal stock of health.
ii. The investment in health stock by the individuals will continue when the $M_B > M_C$ and
iii. If $M_B < M_C$ the investment in health stock will be stopped.

H_{min} is the minimum stock of health required to live. When $H_t < H_{min}$ the consumer is nearing death. The health benefits are classified into two ways:

(1) The consumption benefits of health, and
(2) The production benefits of health.

The Inter-temporal choice on utility of a consumer is a function of inherited stock of health such as stock of flow per unit, demand for health service consumption, and consumption of the alternative commodity. Consumption benefits are basically the enjoyment from being healthy and the satisfaction from not being ill. Net investment in the stock of health equals gross investment is subtracted by deprecation (i.e. $N_I = G_I – D$). Though the rates of depreciations are assumed to be an independent, but they may differ with age factor. From the individual perspective, both market and own time is limited resource. The budget constraint of the goods equates the present value (PV) of spending on goods to the present value (PV) of income over the period of time and addition with the initial assets. The time constraint necessitates that the total amount of time available in any period must be exhausted by all possible uses. If sick time is not added to market and non-market time, then total time would not be exhausted by all possible uses. The PV of MC of gross investment in period 'i – 1' must equal the PV of MB. In equilibrium, the total rate of return on an investment in health must equal the user cost of the health capital in terms of the price of GI. The production benefits determine the total amount of time the individual can spend in producing money earnings and commodities. If the individual is healthy less income is lost due to illness and ultimately less time off from productive work. In Grossman's model of health demand, health is endogenous, in the uncontroversial sense that individuals choose the optimal amount of it that they need so as to produce "healthy days." In other words, health status is governed by health investment and consumption activities of individuals. This is a major contribution of the model to policy making because it links health status to health maintenance activities of households and society.

V. METHODOLOGY

This study is based on both primary as well as secondary data. The primary data has been collected from the study area (Chennai City) with the help of interview schedule. The interview schedule included questions on demographic and socio-economic aspects. The empirical outputs of the data have been analyzed by

using SPSS and E-views software packages. Some of the opted econometric techniques have been used to analyze the following objectives of the study.

1) The **'self-reported illness'** indicators are estimated by using OLS, PROBIT and LOGIT techniques. **'Health expenditure'** and **'number of days lost'** are estimated by OLS and TOBIT techniques,
2) Correlation and regression analysis are also applied to examine the relationship among the variables in this study.

The secondary data have been collected from various sources like journals, publications, online resources and government records.

VI. VI.EMPIRICAL RESULT AND INTERPRETATION

The primary survey has been conducted based on stratified random sampling, for which, the researcher has used the structured questionnaire prepared for it. The secondary sources in terms of theoretical and empirical evidences have been under taken to collect the information from various journals, articles, government records and web sources. The primary survey is conducted in chosen private and government hospitals as well as in households in the area of Tambaram, St. Thomas Mount, Vadapallani, Chollaimedu, Central and Perambur in Chennai city. The primary survey suggests that **'illness' 'amount spent'** and **'days lost'** are reduced with increase in level of wives' education. It is interesting to know how other factors like age, assets, religion, toilet, drainage and exercise dummies influence these indicators.

The demand for health is expressed as functions of prices, wages, other income and environmental variables. In empirical model, we treat price as a constant. We use 'education' in years to capture the effect of wages on the self-reported health status variables. In empirical studies, education is used as a proxy for wage due to problem of missing observations since wage data is not available for all individuals as some of them are unemployed and some others are self employed.

$H_{ij} = \beta_0 + \beta_1 Ed_{ij} + \beta_2 assets_i + \beta_3 E_i + U_{ij}$;
i = 1, 2, 3 … N observations.
j = H, W
H- Husband W – Wife

H_{ij} is the health status of j^{th} member, Ed_{ij} is the education of the j^{th} member, $assets_i$ is the total value of the assets, E_i is the set of environmental and sociological variables. The religion, toilet facility, drainage facility, water availability, boiled water consumption and physical exercises are treated as environmental (household, sociological and personal) dummy variables in the empirical analysis. β's are the parameters to be estimated. U_{ij} is the random disturbance term. For estimation of the above model household-level-data collected through the survey in Chennai city. The description of the variables included in the model and the rationale for including them are discussed here.

VII. MEAN AND STANDARD DEVIATION

The Descriptive Statistics are given in table 1. The endogenous variables namely household level variables and husbands' and wives' health indicator variables are alternatively measured in order to check the results sensitivity to the measures. It is evident from table 1 that the mean year of husbands' education is greater than that of wives in the sample households. The mean assets are greater than standard deviation of assets indicating a less degree of variability in the distribution of assets among the sample households. The result shows that 80 per cent of the households provided with toilet facility, whereas 63 per cent of the households are equipped with safe drainage facilities. Husbands' mean age is greater than that of wives by 2.59 years. Husbands' mean probability of illness is 0.46. But it is 0.52 for wives indicating a negative association between education and probability of illness. Mean 'Time lost' for husbands is 1.24, which is less than that of wives (1.56). Moreover, mean value of 'amount spent' by husbands (60.46) is also less than that of wives (75.90). These results also support the expected education - health relationships.

Table – 1: Estimation of Mean and Standard Deviation

Variable	Mean	S.D.
Endogenous Variables		
Husbands' Health Indicators		
Illness Dummy	0.46	0.49
Days Lost (in days)	1.24	1.74
Amount Spent (in Nu.)	60.46	115.34
Wives' Health Indicators		
Illness Dummy	0.52	0.50
Days Lost (in days)	1.56	1.94
Amount Spent (in Nu.)	75.90	128.25
Households' Health care Expenditure for a Month	152.45	154.37

Exogenous Variables		
Husbands' Age	45.67	9.60
Husbands' Education (in years)	9.41	3.21
Wives' Age	43.08	9.66
Wives' Education (in years)	8.30	3.27
Assets Value of the Household	1.90E5	104534.41
Religion Hinduism Dummy Variable = 1 if Hinduism, 0 otherwise	0.95	0.21
Toilet Dummy Variable = 1 if facility is available, 0 otherwise	0.80	0.40
Drainage Dummy Variable = 1 if facility is available, 0 otherwise	0.63	0.48
Water Source Dummy = 1 if source is available, 0 otherwise	0.91	0.29
Boiled Water Consumption Dummy =1 if consumed, 0 otherwise used	0.57	0.50
Physical Exercise of the Husband Dummy = 1 if he does, 0 otherwise	0.47	0.50
Physical Exercise of the Wife Dummy = 1 he she does, 0 otherwise	0.42	0.49
Number of Households	**693**	

Source: Primary Data

VIII. VIII.RESULT OF THE REGRESSION MODEL

The empirical model is estimated by OLS, Maximum Likelihood estimates of PROBIT, LOGIT and TOBIT methods.

Table – 2: Estimation of the Determinants of Illness Probabilities Using Ordinary Least Squares (OLS), Maximum Likelihood Probit (PROBIT) and Logit (LOGIT)

	Husbands			**Wives**		
Variables	**OLS**	**PROBIT**	**LOGIT**	**OLS**	**PROBIT**	**LOGIT**
Age	0.01066* (8.2930)[a]	0.2499* (7.766)[b]	0.48563* (7.1057)[b]	0.0100* (5.265)[a]	0.1665* (7.772)[b]	0.3099* (7.413)[b]
Education	-0.0070* (-1.6442)	-0.1146* (-1.607)	-0.2372* (-1.7399)	-0.027* (-5.604)	-0.2357* (-6.364)	-0.420* (-6.027)
Assets	-2.14E-* (-1.6650)	2.63E-0 (0.190)	4.84E-08 (0.01823)	-3.64E* (-2.223)	-2.23E-* (-2.230)	-3.70E-* (-2.071)
Religion Hinduism	-0.00910 (-0.2111)	0.83876 (1.589)	1.63261* (1.6121)	-0.0063 (-0.111)	-0.22807 (-0.582)	-0.40813 (-0.614)
Toilet	-0.1017* (-3.1442)	-1.9441* (-4.745)	-3.3616* (-4.4029)	-0.234* (-5.373)	-2.9259* (-6.693)	-5.6603* (-6.138)
Drainage	-0.03122 (-1.1292)	-0.36532 (-1.250)	-0.83869 (-1.452)	-0.0212 (-0.577)	-0.18235 (-0.874)	-0.39726 (-1.070)
Boiled Water Consumption	-0.5020* (-17.411)	-2.2599* (-7.543)	-3.9216* (-6.955)	-0.082* (-2.665)	-0.08849 (-0.504)	-0.12039 (-0.387)
Physical Exercise	-0.2563* (-8.9674)	-0.6789* (-2.573)	-1.2133* (-2.523)	-0.312* (-8.457)	-0.4703* (-2.301)	-0.8723* (-2.414)
C	0.46577* (5.5481)	-8.0760* (-5.805)	-15.975* (-5.578)	0.7631* (6.415)	-1.45564 -(1.598)	-2.7412* (-1.641)
R-squared / McFadden R-Squared	0.763508	0.820118	0.819008	0.58228	0.646456	0.64977
Log likelihood	-1.18563	-86.0132	-86.5443	-200.11	-169.690	-168.095
F-Statistic / LR Statistic (8 df)	276.0349	784.3058	783.2437	119.186	620.5583	623.7471
Total	**693**	**693**	**693**	**693**	**693**	**693**

Note: a. Figure in parenthesis denote't' values. b. Figures in parenthesis denote asymptotic't' values. * = Statistically Significant at the level of 10 per cent or less.

'Illness' Equation: The results of illness equations estimated by OLS, Maximum Likelihood PROBIT and LOGIT are presented in Table 2. The elasticity estimates of husbands' and wives' health indicator equations are presented in tables 5 and 6 respectively. Husbands' illness is found to be influenced negatively by husbands' education. The effect is statistically significant at 10 per cent level. The elasticity estimate of husbands' illness with respect to husbands' education shows that a one per cent increases in husbands' education reduces illness by 0.14 per cent. However, the change in illness proportion is less than that in husbands' education. It could be due to the fact that apart from husbands' education, there are other variables which influence illness, or else, the educated people in the study area do not have enough/good knowledge about proper nutritional intake and its possible effect.

The coefficient of households' 'assets' (in OLS) is negative and significantly influences the husbands' 'illness' at 10 per cent level. Husbands' age has a positive effect on husbands' illness. The effect is statistically significant at 1 per cent level. It indicates that as individual (male) ages, his chance of falling ill is more. A one per cent increase in husbands' age, increases husbands' illness by 1.05 per cent. Among the household-specific environmental variables, toilet and drainage facility variables have negative signs. Toilet availability is influencing husbands' and wives' illness probability significantly at one per cent level. Elasticity estimate suggests that a 1 per cent increase in toilet and drainage availability decrease the husbands' illness probabilities by 0.17 and 0.042 per cent respectively. The personal character variables 'boiled water consumption' and 'physical exercise' have negative influences on husbands' illness. Both the variables are influencing husbands'

illness probability significantly at 1 per cent level. As per elasticity estimates, a 1 per cent increase in boiled water consumption dummy leads to 0.62 per cent decrease in husbands' illness probability. Elasticity estimate suggests that a 1 per cent increase in husbands' physical exercise leads to 0.26 per cent decrease in husbands' illness.

The variable wives' education is negatively associated with her 'illness' probabilities. Its effect is also statistically significant at 1 per cent level. Elasticity estimates of wives' illness with respect to wives' education shows that a 1 per cent increases in wives' education would decrease wives' 'illness' by 0.43 per cent. Wives' age has a positive effect on wives' illness. The results are also statistically significant at 1 per cent level. As per elasticity estimates, a one per cent increase in wives' age leads to 0.84 per cent increase in wives' illness probability.

Among the household-specific sociological and environmental variables Hinduism; toilet, drainage availability, boiled water consumption and physical exercise influence wives' illness negatively as shown in table 2. Toilet availability and physical exercise variables are influencing wives' illness significantly at 1 per cent level. One per cent increase in toilet and physical exercise decrease wives' illness by 0.36 per cent and 0.25 per cent respectively. Boiled water consumption variable is also influencing wives' illness (OLS) significantly at one per cent level. Elasticity estimate suggests that 1 per cent increase in boiled water consumption decrease wives' illness by 0.09 per cent.

Table – 3: Estimates of the Determinants of Days Lost due to Illness/Injury of Husbands and Wives Using Ordinary Least Squares (OLS) and Tobit (TOBIT)

	Husbands		**Wives**	
Variables	**OLS**	**TOBIT**	**OLS**	**TOBIT**
Age	0.012270* (1.611)[a]	0.008130 (0.567)[b]	0.052553* (5.493)[a]	0.078423* (5.259)[b]
Education	-0.12862* (-5.052)	-0.28960* (-6.485)	-0.20882* (-8.571)	-0.35129* (-9.237)
Assets of the Household	-8.04E-07 (-1.055)	-3.22E-0* (-2.180)	-2.06E-0* (-2.512)	-3.04E-0* (-2.384)
Religion (Hinduism)	0.52575* (2.060)	0.890616* (1.839)	0.068200 (0.238)	0.295938 (0.654)
Toilet	0.172876 (0.902)	0.503657 (1.576)	0.299165 (1.372)	0.634524* (2.007)
Drainage	-0.30994* (-1.893)	-0.70003* (-2.486)	-0.116345 (-0.631)	-0.280862 (-1.026)
Boiled Water Consumption	-0.49451* (-2.898)	-0.76115* (-2.646)	-0.032247 (-0.208)	-0.037718 (-0.166)
Physical Exercise	-0.53026* (-3.133)	-1.49631* (-4.828)	-0.129238 (-0.699)	-0.57753* (-2.070)
C	2.21868* (4.465)	3.393863* (3.626)	1.570993* (2.642)	0.858092 (0.925)
R – Squared	0.311496	0.258969	0.330013	0.287156
Log Likelihood	-1233.432	-950.4764	-1315.149	-1124.738
F – Statistics	38.682		42.11437	
Total observation	**693**	**693**	**693**	**693**

Note: a. Figure in parenthesis denote't' values.
b. Figures in parenthesis denote asymptotic't' values.
* = Statistically Significant at the level of 10 per cent or less.

(i) 'Days Lost' Equation: The estimated results of 'days lost' equation are presented in table 3. In this equation, the effects of husbands' and wives' education coefficients are negative. The effects of husbands' and wives' education are also statistically significant at 1 per cent level. The sign of the coefficients implies that as husbands' education increases, days lost decreases. The elasticity estimation suggests that a one per cent increase in husbands' and wives' education respectively decrease 'days lost' by 0.91 and 0.92 per cents. Households' 'assets' variable has also got the expected negative sign with husbands' and wives' 'days lost' equation. Households' 'assets' influence significantly wives' and husbands' 'days lost' probability at one per cent and five per cent level respectively. The elasticity estimate suggests that a one per cent increase in households' assets decreases husbands' and wives' 'days lost' by 0.11 per cent and 0.20 per cent respectively. The effect of husbands' age on 'days lost' is positively influencing. Its effect is statistically significant in OLS at 10 per cent level. As per elasticity estimates is concerned, a one per cent increase in husbands' age leads to 0.42 per cent increase in husbands' 'days lost' probability. It indicates that husbands' age increases their 'days lost' due to illness less than proportionately. The sociological variable 'Hinduism' positively and significantly influencing the husbands' days lost at 5 per cent level. The boiled water consumption and physical exercise dummy variables are negatively and significantly

influencing husbands' days lost at one per cent level. The drainage variable is negatively associated with husbands' 'days lost' and the result is statistically significant at 5 per cent level.

There is a positive relation found between wives' age and 'days lost'. The result is statistically significant at one per cent level. The household-specific environmental variable toilet availability is influencing wives' days lost positively and significantly at 5 per cent level (Tobit). The other variables such as drainage facility, boiled water consumption and physical exercise have negative effect on wives' 'days lost'. The effect of physical exercise on wives' 'days lost' is statistically significant at 5 per cent level. The elasticity estimation suggests that a 1 per cent increase in households' assets and other dummy variables such as drainage, boiled water consumption and physical exercise lead to 0.14, 0.21 and 0.18 per cent decrease in wives' days lost respectively.

(ii) '**Amount Spent' Equation**: Table 4 presents results of 'amount spent' by husbands and wives in the event of 'illness' equation. Husbands' education influences 'amount spent' theoretically in two diametrically opposite ways. Firstly, educated parents are medically better informed than their uneducated counterparts. As a result, they may fall sick less often than others and hence, the amount spent on medical services should be less. The other argument is that highly educated parents earn more and hence spend more on better quality medical services.

Table – 4: Estimation of the Determinants of Amount Spent by Husbands and Wives on Health Care Using Ordinary Least Squares (OLS) and Tobit (TOBIT)

Variables	**Husbands**		**Wives**	
	OLS	**TOBIT**	**OLS**	**TOBIT**
Age	2.817107* (5.487)[a]	10.52384* (6.436)[b]	2.502001* (4.365)[a]	5.481741* (3.725)[b]
Education	0.748558 (0.436)	5.302272 (1.088)	-7.764031* (-5.319)	-27.55495* (-7.073)
Assets of the Household	-6.53E-05 (-1.271)	-0.000285* (-1.911)	-5.68E-05 (-1.157)	-0.000150 (-1.155)
Religion Hinduism	9.295765 (0.540)	55.6773 (1.029)	4.978139 (0.290)	27.67441 (0.608)
Toilet	27.71047* (2.146)	97.39347* (2.741)	18.86485 (1.444)	56.67308* (1.865)
Drainage	-15.07424 (-1.366)	-36.01600 (-1.176)	-1.474438 (-0.133)	-21.93612 (-0.819)
Boiled Water Consumption	-12.18166 (-1.058)	-42.27260 (-1.356)	-6.219898 (-0.670)	-8.733616 (-0.390)
Physical Exercise	5.874913 (0.514)	-8.580236 (-0.273)	8.217232 (0.742)	-11.47166 (-0.407)
C	-93.60252* (-2.794)	-680.7744* (-6.089)	6.345443 (0.178)	-111.7099 (-1.209)
R – Squared	0.086765	0.082581	0.148259	0.098111
Log Likelihood	-4151.559	-1692.790	-4151.513	-1901.111
F – Statistics	8.123		14.88267	
Total observation	**693**	**693**	**693**	**693**

Note: a. Figure in parenthesis denote't' values.
b. Figures in parenthesis denote asymptotic't' values.
* = Statistically Significant at the level of 10 per cent or less.

In the present study, wives' education is negative and significantly influencing wives' 'amount spent' at one per cent level. Elasticity estimate suggests that 1 per cent increase in wives' education decreases her 'amount spent' by 1.11 per cent. As we expect, husbands' age has a positive association with husbands' 'amount spent' and its effect is statistically significant at one per cent level. The elasticity estimation (Table 5) suggests that a one per cent increase in husbands' age would increases husbands' amount spent by 2.74 per cent. In case of households' specific environmental factors, 'drainage' and personal character variable 'boiled water consumption' have an insignificant relationship with husbands' amount spent. Toilet availability has a positive association in husbands' amount spent due to illness. Its effect is statistically significant at 5 per cent in OLS estimates and at one per cent level in Tobit equation.

Table- 5 Elasticity Estimates: Husbands' Health Indicators Equations

	Dependent Variables		
Independent Variables	**Illness**	**Days Lost**	**Amount Spent During Illness**
Age	1.058517	0.423487	2.747596
Education	-0.14456	-0.91468	0.15043
Household Assets	-0.08833	-0.11544	-0.26496

Religion Hinduism	-0.01879	0.377457	0.188594
Toilet Facility	-0.1768	0.104517	0.473426
Safe Drainage Facility	-0.04274	-0.14757	-0.20281
Boiled Water Consumption	-0.62172	-0.21302	-0.14829
Physical Exercises	-0.26179	-0.18834	0.058968

Note: Elasticities are computed using the regression results presented in the second colomns of tables 2, 3 and 4 for the respective indicators.

Table- 6 Elasticity Estimates: Wives' Health Indicators Equations

	Dependent Variables		
Independent Variables	**Illness**	**Days Lost**	**Amount Spent During Illness**
Age	0.84051	1.211537	1.869733
Education	-0.4388	-0.9275	-1.11785
Household Assets	-0.1338	-0.20945	-0.18721
Religion Hinduism	-0.0117	0.034671	0.082036
Toilet Facility	-0.3628	0.128075	0.261794
Safe Drainage Facility	-0.0259	-0.03922	-0.01611
Boiled Water Consumption	-0.0911	-0.00984	-0.0615
Physical Exercises	-0.2542	-0.02905	0.059868

Note: Elasticities are computed using the regression results presented in the column V of table 2 and columns IV of tables 3 and 4 for the respective indicators.

Wives' education is negatively affected her 'amount spent' due to illness. Its effect is also statistically significant at one per cent level. Elasticity estimate suggests that a one per cent increase in wives' education decreases wives' amount spent on medical care by 1.11 per cent. Wives' age has a positive effect on wives' amount spent and statistically significant at one per cent level. Elasticity estimation suggests that a one per cent increase in wives' age increases wives' amount spent by 1.87 per cent.

IX. LIMITATIONS

The results of present study are subject to the following limitations:

- The sample size consists of only limited households, the validity of the study's conclusion are restricted to the extent of the sample size.
- Due to time and cost constraints, the present study is made out of the demand side of the health care alone to estimate the effect of ill-health on human resources, even though the supply side factors such as quality of health care and availability of modern equipments in the health care sector also play a vital part in the health care sector.
- Moreover, the study is also based on 'one round one visit survey' in the study area. Hence, the dynamics of health care consumption is not within the purview of this study.
- Since the reference time frame of the study was one month preceding date of the data collection, it also limits and ignores the long term implications of household health care related decisions.

X. SUMMARY AND SUGGESTIONS OF THE STUDY

The theoretical models, empirical findings and limitations of the study have been discussed in the previous sections. The important results of the study and policy implications are presented here.

- Based on the review as well as by the results of present study, it is found that education influences significantly the health status of the people in the study area. Therefore, macroeconomic policies of the government should aim for the provision of more educational opportunities covering all sections of the people. Generally, even though, the educated people spend more on health care, they have reported less sickness or injury. It indicates that the educated people spend more on preventive health care which has better welfare implications.
- Though the health facilities provided by the government are free of cost to some extent, but the required doctors, nurses and other health care technicians in the government hospitals are found to be inadequate. Therefore, the state government is expected to increase the number of qualified and well trained health care personnel in primary health care to equalize distribution of the health care resources between rural and urban areas.
- Since the study provides evidence that household environmental variable such as availability of toilet, drainage facilities and personal character variables such as hot water consumption, and physical exercise improve health status of adults and children has negative effect on number of days lost, the state government should have the provision to provide adequate sanitation and other environmental variables.

XI. CONCLUSION

People's health needs are not explicit and rendered automatically into health demand, the system must help the individuals to recognize their health care needs and convert them into demand. There is a wider gap in the health care sector and health status of the state, especially in the implementation of the policies, allocation of the budget, administration, organization, management and delivery of programs. A state of balance is very much required between quality and quantity of human resources in health sector in the state. To enhance the government expenditure on health sector, the government should concentrate more on the proper allocation of resources efficiently and finance it to benefit of the poor people.

- The policy implication has to give the proper awareness to all the people about the importance of cleanliness, sanitations, and safe boiled drinking water consumption for better health status.
- Basically, people themselves are the valuable resources, in this circumstances community involvement is must. Individual's, youths, volunteers and families have to take the responsibility for their own society's health development.

Economic growth and health status of the state has bi-directional relations. However, there is strong evidence which shows that there is direct relationship between economic growth and health status in a country.

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