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## INFLUENCE OF INCOME AND EDUCATION ON HOUSEHOLD HEALTH EXPENDITURE: THE CASE OF TRIBAL ORISSA<sup>1</sup>

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### I. INTRODUCTION

Economic growth differs among economies due to the levels and pattern of educational attainment (schooling); population growth; density and age structure; natural resources abundance; personal and government saving (investment rate); physical capital stock; economic policy, for example liberalization, globalization and privatization; the quality of public institutions; the geography, for example the location and climate of the countries. Recent research has added several specific “health indicators” to these factors, and looked at the links between them and economic growth and development. There are direct and positive links between economic performance and health indicators. Investing on health is a tool of macroeconomic policy as it enhances the economic growth rate. Interestingly, economic historians have concluded that perhaps thirty per cent of the estimated per capita growth rate in Britain between 1780 and 1979 was a result of improvement in health and nutritional status (Fogel, 1997). A strong partial correlation exists between health (as proxied by life expectancy) and output per worker (and, hence, growth) (Knowles and Owen, 1997).

Little research has been done to examine the extent to which the money that poor families spend on health care affects their nutritional status and thereby their health and survival particularly of women and children (Werner, 1995). Recent individual and household level studies have, however, paid more attention to health and are reaching increasingly consistent findings (Strauss and Thomas, 1998). In this context the present study is a micro study. The study tries to find out the influence of household income (PHI) and education of the head of the household (EDN) on the pattern of health expenditure (PHE). The paper has four sections. Section I deals the introduction of the paper. Section II reviews the impact of income and education on health. Section III analyses Section II empirically and Section IV summarizes the paper.

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## II. REVIEW OF LITERATURE

### **Influence of Income on Household Health Expenditure**

Of all the determinants of health, why should poverty be picked out for particular attention? The answer lies in the fact that poverty, worldwide, is clearly associated with poor health. It is a major determinant of health, and has a profound effect on well-being. The concept of poverty is often mixed up with other terms such as deprivation, inequality, disadvantage, alienation and marginalization (Calman, 1997). Earlier analysis of the British experience in the nineteenth century (McKeown, Brown and Record, 1972) and the Latin American experience prior to 1930s (Arriaga and Davis, 1965) showed that mortality decline was closely related to improvement in living standards rather than medical breakthroughs. From the 1930s to the 1960s, however, it was claimed mortality reduction were largely independent of increase in living standards (Arriaga and Davis, 1965). Per capita income is the mostly wide discussed socioeconomic determinants of mortality, primarily because it is considered a summary of the ability of an economy to meet the needs of its citizens (Cochrane, 1980).

From being among the first nations that recognized the centrality of *poverty* for health planning, India today faces a crisis in public health. The first comprehensive document on health planning produced by the government in 1946 recognized that *unemployment and poverty* have profoundly adverse effect on health through the operation of such factors as inadequate nutrition, unsatisfactory housing and clothing and lack of proper medical care during periods of illness (Qadeer, 1995). Despite rapid economic growth, over a billion humans still exist in absolute, degrading poverty. Because ill health traps people in poverty, sustained investment in health of the poor could provide a policy lever for alleviating persistent poverty.

Poverty is a major cause of low health standard (Abel-Smith and Leiserson, 1978). Health expenditure of the household members of rural India is sensitive to changes in household income levels and the elasticity of health expenditure with respect to income is largest for high-income groups (Mathiyazhagan, 2003). Poverty squatter and disease go together. Health status is a matter of economic power. More the capacity of persons to purchase the health and medical care services, the more likelihood of better health status to emerge. Negatively, the poorer section of the population suffers badly in the maintenance of this health and treatment of disease because of poor financial status (Sharma, 2000). A large gap between rich people and poor people leads to higher mortality through the breakdown of social cohesion (Kawachi and Kennedy, 1997).

The impact of poverty on ill health is well known and extensively documented. Ill health can also be an important cause of poverty because it can lead to loss of income, catastrophic health expenses, and

orphanhood. Thus improving health can make a substantial contribution to target 1<sup>3</sup>, which aims to halve between 1990 and 2015 the proportion of people whose income is less than \$1 a day. (Haines Andy and Andrew Cassels, 2004). Overall economic growth – particularly poverty-reducing growth – and education are central to good health (WB, 1993)

### **Influence of Education on Household Health Expenditure**

The positive association between education and health is well established but explanations for this association are not. Well-educated people experience better health than the poor educated, as indicated by high levels of self reported health and physical functioning and low levels of morbidity, mortality and disability (Ross and Wu, 1995). In contrast, low educational attainment is associated with high rates of infection disease, many chronic noninfectious diseases; self reported poor health, shorter survival when sick, and shorter life expectancy (Feldman, Makuc, Kleinman and Cornoni-Huntley, 1989; Guralnik, Land, Fillenbaum and Branch, 1993; Morris, 1990)<sup>i</sup>. The positive association between health and socioeconomic status, whether measured by education, occupation or income, is largely due to the effects of socioeconomic status on health, not vice versa, and downward morbidity among persons in poor health cannot explain the association (Doornbos and Kromhout, 1990).

Why is education associated with good health? The theoretical explanations fall in to three categories: (1) work and economic conditions, (2) social-psychological resources, and (3) health life style. According to the first explanation, well educated people are less likely to be unemployed and more likely to have full time jobs, fulfilling work, high incomes, and low economic hardship. According to the second, the well educated have social psychological resources, including a high sense of personal control and social support, in addition to economic resources. According to the third, the well educated have healthier life style; compare to the poorly educated, the well educated are more likely to exercise, to drink moderately, to receive preventive medical care, and less likely to smoke (Ross and Wu, 1995).

Cochrane (1980) concludes that per capita income is highly correlated with life expectancy in all periods examined, but the elasticity of life expectancy with respect to income levels has declined since the 1930s and 1940s; income distribution seems to be significant in explaining life expectancy in most studies, but somewhat less important in explaining infant mortality. It is not completely clear whether income inequality in itself is important, or whether it is factors associated with more equal distribution of income, such as literacy or access to health services, which are important. In simple correlation analysis literacy seems to be the most important variable explaining life expectancy while caloric intake seems somewhat

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<sup>3</sup>Target 1 of Millennium Development Goals (MDGs) declared by United Nations

more important for infants and young children. In all cases literacy has a higher level of significance than does doctors per capita, but in some cases calories are less significant than doctors. In the studies, which include income inequality and literacy, the results were mixed. Literacy always remains significant, but income inequality varies substantially in its relative and absolute importance, but was significant in two of the three cases. Income per capita's significance varies greatly, depending on what other variables are included.

### **III. EMPIRICAL STUDY FROM TRIBAL ORISSA**

#### ***Database and Methodology***

The study is fully based on primary data collected for the month of October 1999 from Nawarangpur district which is selected on the basis of random sampling method from the top ten districts in terms of tribal population as per the 1991 census. The sampling unit is household (HH). The total sample size consists of one hundred twenty five HHs. Multi-stage random sampling method is adopted to select HHs.

In stage I, Kosagumuda Block is selected at random out of ten blocks of Nawarangpur district. In stage II, Rajore and Pand-Gura Gram Panchayatas (GPs) are selected on random basis out of twenty two GPs of Kosagumuda Block. In stage III, Rajore village, out of ten villages of Rajore GP and Kandapuri village out of twelve villages of Pand-Gura GP are selected randomly. In stage IV, eighty seven HHs, out of four hundred twelve HHs of Rajore village and thirty eight HHs, out of one hundred eight two HHs of Kandapuri village are selected on the basis of random sampling method with proportional allocation.

To substantiate the first objective, i.e., to find out the effect of income and education on health expenditure regression analysis is used and descriptive statistics are estimated. Mainly, three variables are used for this purpose: household health expenditure, income of the household and education of the head of the household. To represent the household health expenditure, per head health expenditure (PHE) is calculated by dividing total annual health expenditure of the household by the household size. Similarly, for income of the household, per head income of the household (PHI) is calculated by dividing total annual household income by size of the household. Dummy variable is used for education in the regression analysis, those head of the family is educated the value one is assigned and those of uneducated, zero value is assigned.

### **Result Discussion**

The descriptive statistics for tribal area shows (see Table 1) that per head income (PHI) is Rs. 5143.75 per annum with 2555.27 and 0.5 as standard deviation and coefficient variation respectively where as per head health expenditure (PHE) is Rs. 108.13 per annum with 91.36 and 0.84 as standard deviation and coefficient variation respectively. The mean education is 0.22 with 0.41 and 1.91 as standard deviation and coefficient variation respectively.

In tribal Orissa, an average person spends around two per cent of his / her income only on health expenditure from his own pocket where as it is around nine and eight per cent in rural and urban areas respectively because their PHI is very low (fifty two and twenty one per cent of rural and urban PHI respectively). Secondly, the tribal people adopt their own traditional methods of treatment which is less expensive, without going to hospitals, even if it is available in the locality. They more believe in their village God and think by worshiping God any type of diseases will be cured automatically. Superstitions and blind beliefs prevail in this area. Thirdly, the education level of these people are also very less than the people of rural and urban areas. Fourthly, they use the local made medicines prepared from roots and leaves of different forest plants.

**TABLE 1: DESCRIPTIVE STATISTICS**

VARIABLES	PER HEAD INCOME	PER HEAD HEALTH EXPENDITURE	EDUCATION
Mean	5143.75	108.13	0.2160
Standard Deviation	2555.27	91.36	0.4132
Coefficient of Variation	0.5	0.84	1.91
Highest Value	16666.67	600.00	1.00
Lowest Value	1666.67	21.43	0.00
Range	15000.00	578.57	1.00

Source: **Compiled from Primary Data**

In tribal area, to find out the impact of household income (PHI) and education of the head of the household (EDN) on the pattern of health expenditure (PHE) a linear regression model is found (see Table 2) to be fitted as  $PHE^T = 31.37 + 0.43PHI + 0.06EDN$  with  $R^2$  value **0.18**, which indicates that, **ceteris paribus**, a rupee increase income brings about forty-three paise increase health expenditure and an educated person on an average spends six paise more in a rupee than the uneducated person on health expenditure in tribal area.

In tribal area, the positive influence of income on health expenditure is less than in rural and urban areas because of the low PHI. But an interesting finding is that the influence of education on health care expenditure in tribal area is double that of rural and urban areas (an educated person in tribal area, on an

average spends six paise more in a rupee than the uneducated person on health expenditure where as an educated person in both rural and urban areas, on an average spends three paise only more in a rupee than the uneducated person). This is because the relative values of education for rural people are more than the people of rural and urban areas.

**TABLE 2: REGRESSION OUTPUT: ANOVA**

	Sum of Squares	df	Mean Square	F	Sig.	R <sup>2</sup>	Std error	D-W Stat.
Regression	189432.523	2	94716.262	13.667	.000	.18	83.2473	2.049
Residual	845474.108	122	6930.116					
Total	1034906.631	124						

a Predictors: (Constant), EDN, PHI

b Dependent Variable: PHE

**COEFFICIENTS**

	Standardized Coefficients	t	Sig.	95% Confidence Interval for $\beta$		Correlations		Collinearity Statistics	
				Lower Bound	Upper Bound	Zero-order	Partial	Tolerance	VIF
Constant	31.374	1.728	.087	-4.57	67.317				
PHI	0.425	5.192	.000	0.009	0.021	0.424	0.425	0.999	1.001
EDN	0.060	0.735	.464	-22.536	49.120	0.050	0.066	0.999	1.001

a Dependent Variable: PHE

Source: **Compiled from Primary Data**

To improve the health status of the people, extreme poverty and hunger should be eradicated which is the first goal of the Millennium Development Goals (MDGs). The health planners and administrators should be involved in the planning process of the government to reduce poverty and adopt policies for more equitable distribution of income. They can also recommend to have a specific health tax (an earmarked or so-called hypothecated tax) devoted to health care. Again spending more on health services does not necessarily buy better health. It needs an *efficient management and use of resources*. The principle of equality for opportunity for access to services on the basis of need and equal risk, irrespective of ability to pay should be followed.

If efficiency and also economy in administrative costs are to be achieved, global financing of providers according to appropriate workload ought to be another guiding principle. This will share with equitable public health services more generally, to ensure that – within available resources – the money follows the patient. Hospital and other providers are funded according to workload but this should not be carried out on the basis of a market mechanism. Such a mechanism can undermine the cooperative ethic in very practical ways. This is not just a general altruistic objection but also an empirical statement based on the deleterious consequences of even public sector markets (for example, in diminishing cooperation between

hospitals, between hospital and community services, and between purchasers and providers) (Paton, 1995).

Health is a function, not only of medical care but also of the overall integrated development of socio-cultural, economic, educational and political factors. Therefore to raise the health status and quality of life, a focused approach integrating the development of social, cultural, economical and educational needs to emerge to bring about the overall transformation of a society.

To tackle poverty, hence, health, it is necessary to consider individual and community. Community development projects that involve people in improving the local environment can provide a useful vehicle within which a wide variety of approaches can be used. The approaches are (i) putting the subject of poverty on the agenda of groups and organizations, (ii) targeting resources and expertise appropriately, (iii) developing educational opportunities, (iv) appropriate tax and benefit measure, (v) ensuring employment opportunities, (vi) changing the environment, and (vii) providing adequate housing. These measures are essential, providing both a better environment and opportunities for all. They all attempt to improve quality of life, and self esteem (Calman, 1997).

#### **IV. SUMMARY**

Most of the health economics researches dealt with macro aspects of it. Little attention has been given to the micro aspects of Health Economics by the researchers, government, policy makers and development planners. In this context the present study examines the effect of income and education of the household on its health expenditure based on primary data. Again, it is also found that a large proportion of research in health economics has concentrated on a few key states – Kerala, Madhya Pradesh, West Bengal and Uttar Pradesh – while paying less attention to others (Saigal, 2002). Therefore, it looks at the poverty, education and health relationship with reference to ‘Orissa’.

The study tries to find out the impact of household income (PHI) and head of the household’s education (EDN) on the pattern of health expenditure (PHE). The study is fully based on primary data collected for the month of October 1999 from Nawarangpur district which is selected on the basis of random sampling method from the top ten districts in terms of tribal population as per the 1991 census. To find out the effect of income and education on health regression analysis and descriptive statistics are estimated.

The descriptive statistics for tribal area shows that per head income (PHI) is Rs. 5143.75 per annum with 2555.27 and 0.5 as standard deviation and coefficient variation respectively where as per head health



expenditure (PHE) is Rs. 108.13 per annum with 91.36 and 0.84 as standard deviation and coefficient variation respectively. The mean education is 0.22 with 0.41 and 1.91 as standard deviation and coefficient variation respectively. To find out the impact of household income (PHI) and education of the head of the household (EDN) on the pattern of health expenditure (PHE) a linear regression model is found (see Table 2 and Figure 4.3) to be fitted as  $PHE^T = 31.37 + 0.43PHI + 0.06EDN$  with  $R^2$  value **0.18**, which indicates that, **ceteris paribus**, a rupee increase income brings about forty-three paise increase health expenditure and an educated person on an average spends six paise more in a rupee than the uneducated person on health expenditure in tribal area.

The health planners and administrators should be involved in the planning process of the government to reduce poverty and adopt policies for more equitable distribution of income. They can also recommend having a specific health tax (an earmarked or so-called hypothecated tax) devoted to health care. Again spending more on health services does not necessarily buy better health. It needs an efficient management and use of resources. The principle of equality for opportunity for access to services on the basis of need and equal risk, irrespective of ability to pay should be followed.

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